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From the Editor

This is a very rich issue with a number of research papers and reviews from the region in addition to a review on virology and MERS.

A multi-country cross-sectional study was conducted in six countries of EMR attempt to identify the current practices and perceptions of family physicians regarding health promotion, disease prevention including periodic screening and health checks in Eastern Mediterranean Region.

Family Physicians who were currently practicing in different countries of EMR were invited to participate in the study. A pre-tested structured questionnaire was used for data collection. Data was entered and analyzed on SPSS 19 and logistic regression analysis was performed. A total of 100 physicians' data was included in the final analysis. Approximately 53% of Family physicians always recommend periodic screening and health checks to their patients. The authors concluded that periodic screening and health check is an important strategy to prevent disease and maintain health. It is an underutilized practice and a great need exists for its implementation in family practice.

A prospective interventional study carried out on 120 participants paper from Egypt evaluated the effect of Dietary Approaches to Stop Hypertension (DASH) diet on normotensive individuals; pre-hypertension and hypertensive grade 1 patients as well as to identify time needed for DASH to reduce BP in pre-hypertension and hypertensive grade 1 patients. Participants were equally distributed in three groups; normotensive, pre-hypertensive hypertensive grade 1 participants (40 in each group). The authors found significant reductions in systolic and diastolic BP among pre-hypertension by (8.1, and 16.4 mmHg respectively with P < 0.001) and hypertensive participants by (5.8, and 7.4 mmHg respectively with P < 0.001) were observed. Reduction was greater in the first 8 weeks and reached a plateau after 12 weeks. BP decrease in normotensive group was insignificant.

The authors concluded that adherence to DASH diet has rapid and statistically significant improvement in systolic and diastolic blood pressure in hypertensive grade 1 and pre-hypertensive participants. Hence, DASH diet was found effective as a first line intervention of elevated blood pressure.

A paper from Suez Canal University identifies the magnitude and the burden of TB stigma on patient and effect of TB stigma on treatment adherence. A total of 53 patients consented to participate. There was an immense stigma observed among urban residence (57.7 %), current smokers (60.0 %) and those had two or less rooms in their house (66.7 %) and this was found to have statistically significant difference (P<0.05).The majority of patients (67.9%) take treatment regularly. The authors concluded that TB stigma has been raised as a potential barrier to home and work-based direct observational therapy (DOT). Perceived TB stigma had no effect on treatment regularity. Health education programs should be conducted to reduce TB stigma and improve patients compliance.

A paper from Iraq is concerned with estimation of some biophysical parameters in fertile and infertile patients. The results of this study in shows that, there are significantly decreases in the viscosity and relative viscosity between fertile and infertile patients seminal fluid, and(density and kinematic viscosity) no significantly differences between fertile and infertile patients at range of P<0.05. The project concluded by demonstration of the changes of viscosity of semen. Where displayed and explained changing in relative viscosity and kinematic viscosity. Their effects on the physiology of human body, moreover to the disadvantage of increasing and decreasing of semen density with the locality of people.

A cross sectional study from Cairo University in which 100 adult diabetic patients were interviewed and the visual acuity, retinopathy status, and presence of other ocular diseases were assessed. The objectives of this study were to assess the awareness of diabetic patients about the screening for diabetic retinopathy and to detect the presence of different stages of retinopathy among a sample of patients attending the Diabetic clinic. It was found that there is general awareness of diabetic retinopathy among the majority of the study participants; however there is little awareness as regards the importance of screening. The main barrier for performing fundus examination was lack of awareness of its importance. The authors concluded that awareness creation is crucial for decreasing diabetic eye complications.

A cross sectional analytic study, a sample of 100 asthmatic patients was selected from patients attending Al Bateen Family Medicine clinic in Abu Dhabi Each patient responded to a structured questionnaire assessing his/her knowledge about asthma aetiology,

pathophysiology, symptoms, treatment and triggering factors; and evaluating his/her attitude and behaviour regarding asthma diagnosis, inhalers, anti-inflammatory drugs and non-medical methods of treatment , and assessment of their inhaler skills. The main sources of information about asthma were health workers (56%) and Newspapers and magazines (18%). 70% believed that asthma can be life threatening, asthma was believed to be initiated by infections in 86% of patients and weather changes by 49%. The reasons of acute exacerbations were Perfumes (87%) and upper respiratory tract infection (86%). The authors concluded that Asthmatic patients in Bateen Clinic have false beliefs and poor inhaler skills about asthma management. Most of them use inhalers for treatment of asthma attacks and less than half do not use preventers regularly when prescribed. Most of patients believe that preventer therapy lead to its addiction, most of them are lacking inhaler skills especially coordination actuation with inhalation, most patients avoid exercise to avoid acute exacerbations. Patients' ideas, concerns and fears regarding asthma management should be explored during consultation; inhaler skills should be reviewed also in each visit.

A review by our publisher looks at Virology vigilance - an update on MERS and viral mutation and epidemiology for family doctors. She stressed Viruses have been with mankind and the animal kingdom since recorded history and their aetiology is still not fully known. Throughout history the influenza viruses particularly, have been the greatest everyday concern to man and Dengue viruses also take large numbers of lives in endemic areas. While there are viruses specific to humans and particular animal species, the problematic viruses have become those that have spread from animals to humans due to mutation. Some of these mutations have then gone on to human to human transmission. Even given better global communications has there been an actual increase in virus mutation and spread? In this past 100 years dramatic new viruses such as HIV, and Ebola, have emerged and spread rapidly among humans and have caused global concern; new strains of corona viruses such as SARS and MERS have been shown to spread rapidly and dramatically into new populations. We are yet to quantify if viruses spreading into new host populations may have an advantage and therefore greater impact on human health in geographical areas other than those in which the viruses originated. It remains an ongoing problem and ongoing work for doctors, technicians and public health personnel, as well as global health organisations. Family doctors who are usually the first contacted and who live in the patient's local environment where the outbreak may have originated, particularly need to be alert not just for evidence and symptoms of existing strains but for pockets of new viral strains/mutations.

Knowledge, attitude and behaviour of asthmatic patients regarding asthma in primary care setting in Abu Dhabi, United Arab Emirates

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Abstract

Background: Adequate knowledge, positive attitude and behaviour as well as proper inhaler use of asthmatic patients are prerequisites for optimal management of bronchial asthma.

Objectives: To assess the knowledge, attitude and practice of patients with asthma with respect to their disease and to examine their skills in using inhaled medications.

Patients and methods: In a cross sectional analytic study, a sample of 100 asthmatic patients was selected from patients attending Al Bateen Family Medicine clinic in Abu Dhabi during the period from August 2011 to July 2012. Inclusion Criteria were adult patients known asthmatic for one year or more; patients using inhalers or Diskus inhaler Informed consent was obtained from every patient who agreed to enrol in the study. Each patient responded to a structured questionnaire assessing his/her knowledge about asthma aetiology, pathophysiology, symptoms, treatment and triggering factors; and evaluating his/her attitude and behaviour regarding asthma diagnosis, inhalers, anti-inflammatory drugs and non-medical methods of treatment , and assessment of their inhaler skills.

Results: There were 52% males and 48% females enrolled in the study. The main sources of information about asthma were health workers (56%) and Newspapers and magazines (18%). 70% believed that asthma can be life threatening; asthma was believed to be initiated by infections in 86% of patients and weather changes by 49%. The reasons for acute exacerbations were perfumes (87%) and upper respiratory tract infection (86%). About 59% of the patients did not use inhaled preventers regularly when prescribed because they believe that inhaled therapy is habit forming; (34%) felt uncomfortable taking asthma medication at work or public places or away from home, and 42% of patients avoided exercise due to fear of acute exacerbations. There were (71%) using MDI, (28%) using Diskus inhaler and (13%) using turbo haler. Only a few patients had the correct skills using Metered-Dose Inhaler (MDI), Discus or turbo haler; the mean score of correct use of MDI was 5+.47 out of 8; the mean score of correct use of discus was 4+.82 out of 7; the mean score of correct use of turbo haler was 3+ 0.67 out of 6. Most patients did not use peak flow meter (PFM) in asthma management. About 5% of asthmatic patients tried non-medical methods for the purpose of cure. These included traditional healers.

Conclusion: Asthmatic patients in Bateen Clinic have false beliefs and poor inhaler skills about asthma management. Most of them use inhalers for treatment of asthma attacks and less than half do not use preventers regularly when prescribed. Most patients believe that preventer therapy lead to its addiction; most of them are lacking inhaler skills especially coordination actuation with inhalation; most patients avoid exercise to avoid acute exacerbations. Patients' ideas, concerns and fears regarding asthma management should be explored during consultation; inhaler skills should be reviewed also in each visit.

Key words: asthma, primary care, Abu Dhabi

Introduction

Asthma is a chronic inflammatory disorder of the airways. Anti-inflammatory agents such as inhaled steroids, leukotriene antagonists. are the mainstay of its management. Under-utilization of these agents and reliance on reliever medication has been reported in much of the literature. (1-2)

Bronchial asthma is one of the most common chronic respiratory disorders among all age groups with a reported prevalence of 5 to 10%. (3) During the last decades studies from different countries keeping appropriate statistics have reported a significant rise in asthma morbidity and mortality. (3)

The prevalence of physician diagnosed asthma among governmental primary school children in the United Arab Emirates was 13%, in addition the wheeze by history was 15.6%. (4). Another study carried out by Al Ain University estimated 13 % prevalence of asthma among local Emirates patients. (5)

Adherence to prescribed inhaled corticosteroids is notoriously poor. Even in observational studies where patients were aware of being monitored, average adherence was only 63% to 65 %.(5) Non-adherence to long-term inhaled corticosteroids is thought to be a major reason for treatment failure. (6)

It is known that adherence to the use of inhalers is generally poor. Studies have shown that on average, only 63-65% of participants adhere to their inhaled corticosteroids even while under the period of observation. It is likely that adherence over the longer term is much less and this is suspected to be a major reason for treatment of asthma to fail (7).

Providing information only, versus providing information plus teaching actual skills as part of asthma education intervention trials has not been shown to change patients' self-management behaviours. A scientific review of 12 randomized controlled trials showed that providing information only increased subjects' knowledge of asthma but did not reduce hospitalizations, emergency room visits, unscheduled doctor visits or lost work days and it did not lead to improved lung function or adherence to medication (8).

Asthmatics have been classified into two groups: Deniers reject the fact that they have a chronic illness or are "asthmatic". This group of people tends not to take prophylactic medication. They may fear dependency and lack of perceived control over their illness but as a consequence end up "over-using" B-adrenoceptor agonists. Acceptors understand the chronic nature of asthma and are more likely to adhere to prophylaxis and resort to using short-acting B-adrenoceptor agonists only when needed in an acute attack (9).

Many asthmatic patients think of asthma as being an intermittent illness that does not warrant daily treatment - "it's only asthma", (10) while others believe treatment is only necessary when there is an exacerbation of their disease (11). Adolescents may think they have "grown out" of a childhood illness (10). Teenagers may also be reluctant to ask others to stop smoking in their presence and may even smoke themselves partly due to wanting to 'fit-in' with their peers (12). Many patients, especially children, may be embarrassed to use their inhalers in front of others and do not want the stigma associated with a disease (12). On the other hand, adherence can be increased in patients who have been hospitalized for their asthma as they realize the seriousness of their disease (12).

Misperceptions about the role of inhaled corticosteroids (ICS) in asthma are common and can contribute to lack of adherence in use. Many patients are concerned about the safety of the medication and do not understand why ICS are necessary and these factors are believed to be key contributors to lack of adherence (15). Due to the fact that corticosteroids may not relieve symptoms during an acute attack, some patients may think the medication is ineffective and therefore not necessary (16). 'Steroid phobia' is common, occurring in up to 46% of people who have been prescribed ICS (16). Studies have shown that only 45% of ICS prescribed are actually taken (13, 14).

Barriers to asthma medication adherence are : concern about drug cost and safety; belief that the asthma is not severe enough to warrant daily treatment; concern about drug dependence or diminished effectiveness over time; peer stigmatization; forgetfulness; belief that asthma medication is ineffective; denial that one is asthmatic; difficulty using asthma inhalers; inconvenience; fear of medication side-effects; embarrassment and laziness (17).

In this study we tried to figure out our patients' knowledge, attitude, skills and barriers regarding asthma management to improve their care.

Methods

This was a descriptive, cross sectional study. It had been carried out in a Family Medicine Clinic, which is a part of Ambulatory Health Services, SEHA corporate, Abu Dhabi, UAE. One hundred asthmatic patients were selected from those presenting to a Family Medicine clinic. Inclusion criteria were age 18 years and above, known asthmatic for one year or more. Exclusion criteria were age less than 18 years and patients with COPD. Patients responded to a structured questionnaire assessing their Demographic data (age, sex, education, employment status, duration of asthma), knowledge about asthma aetiology, symptoms, triggering factors, pathophysiology and management, and requiring information about their attitude and behaviour towards the diagnosis of asthma, and use of inhalers. Patients were asked to demonstrate the use of their inhaler and the investigator observed the different steps. All patients gave their informed consent before participating in the study. Data obtained was analysed using the statistical package for the social sciences (SPSS) version 14. The study proposal was approved by the Institute Review Board at Sheikh Khalifa Medical City/managed by Cleveland Clinic under the reference of REC-14.07.2011(RS-168).

Results

Patients' characteristics: A total of 100 asthmatic patients were enrolled in the study. Males were 52% and females were 48%. The majority of patients (43%) were above 50 years. About 5% were without education and 60% had college education. (Table 1)

Table 1: Demographic data

Category	Number (100)	(Percent)
Gender		
Male	54	(54%)
Female	46	(46%)
Age group		
18-30	34	(34%)
31-40	26	(26%)
41-50	27	(27%)
Above 50	43	(43%)
Education		
1.No school	5	(5%)
2.Elementary	14	(14%)
3.High school	18	(18%)
4.College	60	(60%)
5.Higher education	5	(5%)
6.Literacy classes only	4	(4%)
Smokers	21	(21%)
Exposure to smoke		
1. At home	29	(29%)
2. At work	33	(33%)

Patients' knowledge: Health workers were the main source (56%) of patients' information. Asthma was believed to be life threatening by (71%) of patients. The main causes of acute exacerbations were acute respiratory infection (86%) and perfumes (87%); most patients know symptoms of acute attacks. (Table 2)

Table 2: Patient knowledge about asthma aetiology, pathophysiology and triggering factors

Category	Number 100	Percent
What is your main source of information about asthma?		
1.Newspapers and magazines	18	18%
2. Radio	5	5%
3.TV	14	14%
4.Brochures, posters and other printed materials	12	12%
5.Health workers	56	56%
7.Teachers	2	2%
8.Internet	8	8%
Can asthma be life threatening?		
1. Yes	71	71
2. No	29	29
What could be symptoms and signs of asthma?		
1. Cough	100	100%
2. Wheeze	77	77%
3. Difficult breathing	91	91%
4. Chest tightness	64	64%
5. Do not know	3	3%
How can a person get an acute exacerbation?		
1. Weather changes	49	49%
2. Aspirin	5	5%
3. Exercise	24	24%
4. Smoke	35	35%
5. Perfumes	87	87%
6. Acute respiratory infection	86	86%
7. Do not know	2	2%
What things are effective in controlling asthma?		
1. Avoiding triggers	64	64%
2. Using medication as advised	33	33%
3. **Do not know**	19	19%

Patients' attitude and behaviour: Table 3 (next page) describes the attitude of patients towards asthma and their behaviour regarding use of inhalers and preventive therapy. (57%) of patients usually seek medical care for treatment of asthma. A total of (59%) of asthmatic patients did not use the anti-inflammatory drugs (the preventers) in the form of steroid inhalers when prescribed because they were afraid of lifelong dependence on inhalers .Most patients (76%) have felt comfortable taking asthma medication when they were at work or away from home or in a public place.

Table 3: Attitude and behaviour of patients towards their illness

Category	Number 100	Percent
What would you do if you have symptoms of asthma?		
1.Go to health facility	87	87 %
3.Go to pharmacy	9	9%
4.Got to traditional healer	5	5%
5. Self-treatment options (herbs, etc.)	4	4%
I do not take prescribed inhaler for a longer period because of		
Adverse effect	24	24%
Because they are habit forming	59	59%
Increase in weight	3	3%
It causes other disease like diabetes/ hypertension	5	5%
They did not relieve symptoms	14	14%
I feel comfortable taking my asthma medication when I am at work or away from home or in a public place	76	76%
I tend to avoid exercise as I am afraid of having an asthma attack	32	32%
I feel confident in my ability to exercise without having an asthma attack	58	58%
Once an attack starts, I am not capable of stopping it. I just have to wait until it subsides.	14	14%
I can avoid or minimize most asthma triggers.	64	64%
Do you feel that generally doctors prescribe too much medication	23	23%

Technique of inhaler, Diskus and turbo haler
There were 71 (71%) of patients used MDI, 18 (18%) used Diskus inhaler and 13 (13%) used Turbo haler. Patient demonstrated the use of their inhalers correctly as follows: MDI (40.62%), Diskus (66.66%) and Turbo haler (66%) respectively . The observed different steps in using inhaler techniques are shown in Table 4.

Table 4: Technique of inhaler, discus and turbo haler use

Category	Number	Percent
Correct steps - ask patient to demonstrate how (Inhaler) 71 patients		
1. Shake the inhaler	44	57%
2. Exhale	35	45%
3. Breathing slowly and deeply	34	44%
4. Co-ordination actuation with inhalation	31	40%
5. One actuation with one breath	39	51%
6. Holding the breath after actuation	31	40%
7. Exhale slowly	21	27%
8. Wait for one minute before second action	16	21%
Mean score of correct use of MDI 4.48 ,SD ±1.52		
Correct steps - ask patient to demonstrate how (Diskus) 28 patients		
1. Exhale	18	64%
2. Breathing slowly and deeply	20	71%
3. One actuation with one breath	23	82%
4. Holding the breath after actuation	24	76%
5. Exhale slowly	17	61%
6. Wait for one minute before second action	13	46%
Mean score of correct use of discus 4.54 , ±SD 0.82		
Correct steps - ask patient to demonstrate how (turbo haler) 13 patients		
1. Exhale	8	62%
2. Twist the red grip as far as it will go	8	62%
3.Click, then twist it back as far as it will go to the left	13	100%
4.Inhale,close your lips over the mouth piece, take deep breath	13	100%
5. Holding the breath after actuation	5	38%
6. Exhale slowly	4	31%
7. Wait for one minute before second action.	9	69%
Mean score of correct use of turbo haler 5.07, SD ±0.73		

Only 4 (4%) of study population used PFM for Follow up of asthma management. Only 1 patient knew fully how to use PFM in a correct way. (Table 5).

Table 5: Technique of peak flow meter use

Category	Number 4	Per cent
1. The peak flow meter should read zero or its lowest reading when not in use	3	75%
2. Use the peak flow meter while standing up straight	2	50%
3. Take in as deep a breath as possible	2	50%
4. Place the peak flow meter in the mouth, with the tongue under the mouthpiece	2	50%
5. Close the lips tightly around the mouthpiece	4	100%
6. Blow out as hard and fast as possible; do not throw the head forward while blowing out	1	25%
7. Breathe a few normal breaths and then repeat the process two more times. Write down the highest number obtained. Do not average the numbers	1	25%

Discussion

Successful asthma management depends on many factors; these include sufficient knowledge and positive attitude. A patient with asthma should understand the basic pathophysiology of asthma, know symptoms of acute attacks, identify triggering factors and be able to take appropriate steps to manage their illness. On the other hand, an asthmatic patient should have a positive attitude towards asthma including willingness to follow the physician's instructions to manage the disorder. These two factors interact with each other and with other important factors such as inhaler technique skills to determine the overall patient's compliance. To control these factors, it is important to determine the level of patients' knowledge, to evaluate their attitudes regarding asthma and to assess the patients' skills in using medications in order to plan interventional programmes that may direct their behaviour towards proper management of their illness, thus reducing the overall morbidity and mortality. In this study, knowledge, attitude, skills and behaviour of asthmatic patients regarding asthma were assessed using a questionnaire. (19)

The patients attended a family Medicine Clinic in Abu Dhabi City. Most of them (65%) were educated to a college or higher. The reliability of the questionnaire used in assessment was revised by members of the Research Committee in Al Bateen Family health Center and in Sheikh Khalifa Medical City managed by Cleveland Clinic.

In this study the main source of patients' information regarding asthma was the health worker (56%). This result is consistent with the results of a study conducted to assess patients' knowledge in a tertiary care hospital. The study found that (85%) of patients reported that doctors were the main source of information. This study suggests that patients look up to health care providers as an important source of information therefore clinicians should continue to play an important role in disseminating information on asthma.(20)

In this study (59%) of patients do not take their prescribed inhaler for a longer period because they believe that these medications are habit forming. This is again consistent with the attitude of asthmatics in other studies; it is reported that 50% of patients suffering from chronic diseases do not comply with the doctor's advice on treatment (21) though there has been little agreement about the causes of noncompliance. Among asthmatics there are deniers and acceptors of the diagnosis, including misconceptions about inhalers (24), and it is postulated that these beliefs and attitudes influence the medication practice. (22)

Another factor that affects patients' compliance to treatment is the side effects of medications. (24%) of asthmatic patients in this study were reluctant to use preventive inhaler regularly because of fear of side effects that affected their compliance to treatment and their use of inhalers. Many of these patients gave explanations like inhalers make their symptoms continue for a longer time and they may become dependent on inhalers for the rest of their lives if they started using them. However, the clear explanation for this wrong behaviour is most probably that the use of inhalers makes relatives and colleagues know that they suffer from asthma, which is regarded as a stigma. That is why they are reluctant to accept using them. Patients often combine biomedical facts with alternative beliefs and practices in their approach to illness and physicians should

be aware of this in order to optimize health education and clinical management. (24)

In this study only 4% of patients were using a Peak flow meter for monitoring their asthma. One of the explanations is that prescribing peak flow meters and giving self-management guidelines to all asthma patients is unlikely to improve mortality or morbidity. Patients whose asthma is severe may benefit from such an intervention. (25)

Asthmatic patients in Bateen Clinic have poor inhaler skills and false beliefs about asthma management. Most of them use inhalers for treatment of asthma attacks and less than half do not use preventers regularly when prescribed. Most patients believe that preventer therapy leads to its addiction; most of the patients are lacking inhaler skills especially coordination actuation with inhalation; most patients avoid exercise to avoid acute exacerbations.

Patients' ideas, concerns and fears regarding asthma management should be explored during consultation. Inhaler skills should be reviewed also in each visit.

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DASH Diet: How Much Time Does It Take to Reduce Blood Pressure in Pre-hypertensive and Hypertensive Group 1 Egyptian patients?

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Abstract

Background: Dietary changes that lower blood pressure (BP) have the potential to prevent hypertension and more broadly to reduce BP, thus lowering risks of BP-related complications. Evidence shows that even a small reduction in BP could have enormous benefits.

Objectives: Evaluate the effect of Dietary Approaches to Stop Hypertension (DASH) diet on normotensive individuals; pre-hypertension and hypertensive grade 1 patients as well as to identify time needed for DASH to reduce BP in pre-hypertension and hypertensive grade 1 patients.

Methods: This study was a prospective interventional study carried out on 120 participants attending the out-patient clinic of a family medicine unit, of Dakahlia governorate, Egypt. Participants were equally distributed into three groups; normotensive, pre-hypertensive hypertensive grade 1 participants (40 in each group). Blood pressure and weight and waist circumference (WC) were measured at the beginning of the study then every 2 weeks for 16 weeks.

Results: Significant reductions in systolic and diastolic BP among pre-hypertension by (8.1, and 16.4 mmHg respectively with $P < 0.001$) and hypertensive participants by (5.8, and 7.4 mmHg respectively with $P < 0.001$) were observed. Reduction was greater in the first 8 weeks and reached a plateau after 12 weeks. BP decrease in normotensive group was insignificant. Additionally, there was insignificant reduction in weight and WC among the 3 groups.

Conclusion: Adherence to DASH diet has rapid and statistically significant improvement in systolic and diastolic blood pressure in hypertensive grade 1 and pre-hypertensive participants. Hence, DASH diet was found effective as a first line intervention of elevated blood pressure.

Keywords: DASH, Diet, Blood Pressure, Hypertension, Egypt

Introduction

The prevalence of prehypertension and hypertension among Egyptian adults has been reported as 57.2% and 17.6% respectively. Only 25.2% of the population had normal blood pressure levels of <120/80 mmHg. The highest prevalence of hypertension was found in Ismailia, Alexandria, Menya, Menoufia and Luxor governorates. The prevalence of hypertension among males and females was similar; however, females had a lower prevalence of prehypertension, and a higher prevalence of normal blood pressure, than males (1).

The STEPwise survey conducted in 2011-2012 recorded that the percentage of adult population with raised blood pressure, or currently on medication for hypertension (SBP $\geq$ 140 and/or DBP $\geq$ 90 mmHg), was 39.4%, with females showing higher percentage (40.8%) than males (38.7%). The percentage of population with raised blood pressure increased gradually with age, with the highest percentage (80.5%) among the age group of 55-65 years. Overall, the mean blood pressure was found to be 128/82 mmHg which is considered to be the state of pre-hypertension (2).

There is a gradual increase in cardiovascular risk as blood pressure (BP) increases above even "normal" values of 115/75 mmHg. For individuals aged 40 to 70 years, each increase of 20 mmHg of systolic BP or 10 mmHg of diastolic BP doubles the risk of cardiovascular disease (CVD). In controlled clinical trials, treatment of hypertension reduces the risk of congestive heart failure by 50%, stroke by 35% to 40% and myocardial infarction by 20% to 25% (3).

Dietary factors have an important role in BP homeostasis. In non-hypertensive and pre-hypertensive individuals, dietary changes that lower BP have the potential to prevent hypertension and more broadly to reduce BP and thereby lower the risk of BP-related complications. Even an apparently small reduction in BP, if applied to an entire population, could have an enormous beneficial impact. It has been estimated that a 3 mm Hg reduction in systolic BP could lead to an 8% reduction in stroke mortality and a 5% reduction in mortality from coronary heart disease. In uncomplicated stage I hypertension, dietary changes can serve as initial treatment before the start of drug therapy. Among hypertensive individuals who are already on drug therapy, dietary changes, particularly a reduced salt intake, can further lower BP and facilitate medication step-down. Therefore, the extent of BP reduction from dietary therapies is greater in hypertensive than in non-hypertensive individuals (4).

Although elevated blood pressure can be lowered pharmacologically, antihypertensive medications may be costly, must often be used in combination to achieve adequate blood pressure control, and can be associated with adverse effects that impair quality of life and reduce adherence (5). Although the Dietary Approaches to Stop Hypertension (DASH) diet and other healthy lifestyle changes may not be enough to control severe high blood pressure, yet they often lead to reduced need for blood pressure-lowering medications as well as lower doses of those medications (6).

The DASH diet emphasizes fruits, vegetables, and low fat dairy products; whole grains, poultry, legumes, fish, and nuts, and is reduced in fats, red meat, sweets, and sugar-containing beverages. It is therefore rich in potassium, magnesium, calcium, and fiber and reduced in total fat, saturated fat, and cholesterol. It is also characterized by slightly increased protein content. It is likely that several aspects of the DASH diet, rather than just one nutrient or food, reduces blood pressure (7).

This study aimed at testing the following hypothesis: Adherence to DASH diet causes a significant reduction in systolic and diastolic BP in both study groups (pre-hypertension and hypertensive group 1 patients), and a non-significant reduction among normotensive group. Therefore, DASH diet can cause even more improvement in other risk factors of hypertension. Hence this study aimed at answering the following research questions: Does DASH diet have an effect on systolic and diastolic blood pressure in normotensive individuals, pre-hypertension and hypertensive group 1 patients, and how much time does the DASH diet need to decrease BP in pre-hypertensive and hypertensive patients?

Objectives

1- Evaluate the effect of DASH diet on normotensive individuals; pre-hypertension patients and hypertensive grade 1 patients.
2- Assess time needed for DASH diet to reduce the blood pressure in pre-hypertension patients and hypertensive grade 1 patients.

Methods

Study design:
The study employed a prospective interventional design to evaluate the effect of Dietary Approaches to Stop Hypertension (DASH) diet on Normotensive, Pre-hypertension and Hypertensive grade 1 patients.

Study site and subjects:
The study was conducted in a family medicine unit (FMU) that provides primary health care services in the rural area of Sherbeen, of Dakahlia governorate, Egypt. The study site was purposefully selected because it serves 7 villages, with different socioeconomic levels. Additionally, the unit has a high rate of outpatient visitors (average 30 person/day) seeking different medical services. The health unit was visited on three days per week regularly from June, 2012 till February, 2013. An advertisement was distributed throughout the FMU, announcing to all clients the subject of research and its benefits to help control blood pressure. The inclusion criteria for study participants were as follows: Age between 30 - 60 years; systolic blood pressure <160 mmHg, and diastolic blood pressure <100 mmHg; both sexes; participants willing to follow the advice related to life style modifications. Exclusion criteria for the study participants were: Any age below 30 years, or above 60

years, grade 2 hypertension (systolic > 160 mmHg, diastolic > 100 mmHg), patients with terminal organ failure, history of major cardiovascular events (cerebrovascular accidents), patients with renal disease, pregnant women, patients taking medications that would alter blood pressure as oral contraceptives pills, corticosteroids, hormonal replacement therapy, anti-depressive medications, routine use of aspirin or non-steroidal anti-inflammatory drugs.

Study participants were then classified into three groups, Group 1: normotensive group with (systolic < 120 mmHg, diastolic < 80 mmHg); Group 2: pre hypertensive group with (systolic 120 - 139 mmHg, diastolic 80 - 89 mmHg); and Group 3 hypertensive grade 1 group with (systolic 140 - 159 mmHg, diastolic 90 - 99 mmHg). The grade of the disease was identified from the FMU patient records. Initial recruitment of subjects started then follow-up continued for the next 16 weeks (every 2 weeks). All participants underwent focused medical examination for initial screening before recruitment.

Sample Size and technique:
The sample size was calculated according to the flow of FMU clients as obtained from the FMU records. The number of clients ranged between 20-30 per day, with average of 400-600 visitors /month. For the purposes of the study, every participant needed half an hour to fill out the questionnaire and to measure BP, weight, height, and waist circumference. Hence 10 participants were recruited per day. Enrolment stopped when the number of subjects recruited reached a predetermined sample size of 120 equally distributed among the study groups. Using a systematic random technique over the working days, every 5th patient was approached and asked first verbally for consent to undergo initial screening and participate in the study if found to be eligible. All patients fulfilling the inclusion criteria were asked to share their telephone numbers with the research team for ease of follow up. Participants were recruited for an initial duration of 5 weeks. At the end of the initial recruitment phase a total of 120 individuals were recruited (40 in each group).

Study tools and measurements:

a- Structured questionnaire:
A pre-coded structured questionnaire was used to assess the socio-demographic characteristics, dietary and behavioral information as well as medical information. Demographic data included (age, gender, education, occupation, marital status). Behavioral and dietary information included alcohol intake, physical activities, food taste preferences, cigarette smoking, and frequency of intake of various kinds of foods. All participants were asked about the previous 3-day food record prior to their participation in the study. During the first encounter, participants were interviewed to assess if their diet was unchangeable, using their 3-day food record as a basis for their habitual diet. For example, if they felt unable to decrease their salt intake or increase their fruit and vegetable intake sufficiently, then they were excluded from the study. A total of 120 participants who were judged capable of making the necessary dietary changes were recruited into the study.

b- Anthropometric measurements:
Anthropometric measurements were completed using standardized procedures and were documented in a special checklist developed for the purpose of the study.

- The waist circumference (WC) was measured to the nearest 0.1 cm using a non-stretchable measuring tape passing halfway between the lower border of the ribs and iliac crest, with the tape horizontal through the umbilicus. WC was measured every month for the subsequent 4 months of the study.
- Body weight (WT) was measured to the nearest 50 gram; subjects were in light clothing without shoes, and a standard balance scale was used. Height (HT) was measured with subjects standing fully erect on a flat surface looking straight ahead, with heels, buttocks and shoulders flat to the wall, without shoes; measurements were to the nearest 0.5 centimeter, and a tape was used. The body mass index (BMI) was calculated as the weight in (kilograms) divided by the height in (meters squared) (kg/m2).
- The Blood pressure was measured in the right arm, with the participant in a seated posture with feet on the floor and arm supported at heart level, after at least 5 minutes of rest (8). An appropriate size of cuff and a standard mercury sphygmomanometer were used. A large size cuff was used with obese participants. Two readings each of systolic BP (SBP) and diastolic BP (DBP) were recorded; Participants were advised to evacuate bladder and to stop consuming coffee, tea, or smoking cigarettes, for at least 30 minutes before the BP readings. These measurements with the same precautions were repeated every 2 weeks for the subsequent 4 months of the study. All the sphygmomanometers were checked and calibrated before use.

Study Intervention:
The DASH diet tool as proposed by Hinderliter et al, 2011 (7), was used. The diet was explained on the first day, and started the following day for 16 weeks. Subjects were requested to build up the diet during the first week of the study period to the required number of portion sizes for a DASH-style diet, which they would then maintain for the further study period. This was done to minimize the gastrointestinal side effects of suddenly increasing non-starch polysaccharide. The participants were asked to come to the FMU every 2 weeks to check their blood pressure, and for counseling and discussions regarding the diet. Energy balance was aimed for, and the importance of maintaining a constant body weight was stressed. The study diet was based on the DASH intermediate sodium diet but altered to fit participant's food preferences and portion sizes. Greatest emphasis was placed on consuming the fruits, vegetables and low-fat dairy foods, whole grains, poultry, fish, as well as the salt restriction and weight maintenance. The importance of reducing saturated fat, red meat and refined carbohydrate and increasing complex carbohydrate intakes was also stressed. Suggestions on how to increase fruit and vegetable consumption were also provided. All smokers were advised to quit smoking, and counseling

on smoking hazards was conducted. Instructions were given regarding reducing sodium intake. The level of sodium intake that was aimed for was 2300 mg or less (1 teaspoonful), which was the intermediate level used in the DASH sodium trial (9). Subjects were requested to avoid foods with a high salt content and not to add salt during cooking or at the table. They were shown how to interpret food labels, particularly with regard to sodium content. Guidance as to how to add flavor without using salt was given. Subjects were requested to restrict their coffee and tea intake to not more than six cups a day. If their habitual intakes were higher than these levels, they were asked to reduce to these recommended levels. Under participant's request, diets were organized in sheets according to their needs. Subjects were requested to keep their exercises as usual without any changes.

Data management and statistical analysis:
The pre-coded questionnaires were entered for analysis on SPSS package version 11.0. for quantitative data analysis. Simple frequencies were used for data checking. According to Joint National Committee on the Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (10) all of the following cut-off points were used in the study:

• Age of study participants was categorized into 2 age groups, below 35 years old and above 35 years old.
• Hypertension was identified according to the following criteria:
- Normotensive group (systolic < 120 mmHg, diastolic < 80 mmHg),
- Pre-hypertension group (systolic 120 - 139 mmHg, diastolic 80 - 89 mmHg),
- Hypertensive grade 1 (systolic 140 - 159 mmHg, diastolic 90 - 99 mmHg).

Compliance with Ethical Standards:
The study was approved by the Family Health and Public Health Councils. Selected members constituted the internal review board to guarantee the ethical conformity of the study. Informed verbal consent was obtained from all the participants before recruitment in the study, after explaining the objectives of the work and procedures. All questionnaire forms and clinical sheets were coded to preserve confidentiality that was also guaranteed on handling the data base according to the revised Helsinki declaration of biomedical ethics (11). All participants were informed about the results of their medical examination. Those who were found hypertensive grade 2 were referred to the unit health team for drug prescription, and further follow up.

Results

The study included 120 participants of which 56.7% were females. Participants were equally distributed among the study groups. The mean age of participants in the hypertensive group was found to be significantly older than those in the other two study groups with a mean age of 45.5 ± 7.7 years compared to 39.5 ± 8.3years and 40.2 ± 7.8 years for participants in the normotensive and pre-

hypertension groups, respectively (P = 0.001). The age of most of the study participants were more than 35 years old (72.5%) of which 28.7% were normotensive, 31.1% were pre-hypertension and 40.2% were hypertensive. Only 46.6% of all participants had higher education, of which 32.1% were normotensive, 39.3% were pre-hypertension and 28.6% were hypertensive. Moreover 41.7% of all participants had basic education, of which 34.0% were normotensive, 28.0% were pre-hypertension and 35.7% were hypertensive. There was no significant difference between the study groups regarding gender, marital status, education or occupation [Table 1 - next page].

As regards systolic blood pressure (SBP) readings, the base line reading for normotensive group was 105.3 ± 8.0 mmHg, and then at the end of the study it became 102.0 ± 6.3 mmHg, with mean change 3.3 ± 5.0 mmHg. For the pre-hypertension group, it was 124.3 ± 5.0 mmHg. That became 116.1 ± 5.7 mmHg, with mean change 8.1 ± 5.6 mmHg. As for the hypertensive group it was 146.0 ± 5.8 mmHg, and became 129.6 ± 13.5 mmHg, with mean change 16.4 ± 11.7 mmHg. Although there was no significant change in the normotensive group readings (P = 0.47), there were statistically significant changes in pre-hypertension and hypertensive readings (P <0.001). When comparing the mean change in systolic blood pressure readings among all study groups, a highly significant difference was detected (P < 0.001) with the hypertensive group showing the highest reduction followed by the other two groups. This difference was found across the three groups [Table 2 - next page].

Figure 1 (page 17) displays the mean SBP readings for the study groups, across the follow up period of the study. The effect of DASH diet was most evident on the hypertensive group, where the mean SBP was reduced from 146 mmHg at base line to 129.6 mmHg at the end of 16 weeks and this reduction reached a plateau at 12 weeks.

Regarding the diastolic blood pressure (DBP) readings, the base line reading for the normotensive group was 69.5 ± 4.5 mmHg that became at the end of the study 68.4 ± 3.6 mmHg, with mean change 1.1 ± 2.1 mmHg. Similarly it was 80.8 ± 2.7 mmHg, then 75.0 ± 4.8 mmHg, for pre-hypertension group with mean change 5.8 ± 4.2 mmHg, and was 85.6 ± 5.5 mmHg then 78.3 ± 6.7 mmHg with mean change 7.4 ± 7.1mmHg for hypertensive group. There was no significant change in normotensive group readings (P = 0.83), however, there was a significant change in pre-hypertension and hypertensive groups (P < 0.001). Comparing the mean change in diastolic blood pressure, a highly significant difference was detected (P < 0.001). The hypertensive group showed the highest reduction, followed by the other two groups. The difference was found between the hypertensive and pre-hypertension groups in comparison to the normotensive group [Table 2].

Figure 2 shows the mean DBP readings for the study groups across the follow up period of the study. Both the hypertensive and the pre-hypertension groups started at

Table 1: Socio-demographic characteristics of the study participants

Variables		Normotensive		Pre-hypertensive		Hypertensive		Total		P. Value
		N.	%	N.	%	N.	%	N.	%	
Gender	Male	17	32.7	16	30.8	19	36.5	52	43.3	0.79
	Female	23	33.8	24	35.3	21	30.9	68	56.7	
Age Groups	<35ys	15	45.4	13	39.4	5	15.2	33	27.5	0.001
	>35ys	25	28.7	27	31.1	35	40.2	87	72.5	
Marital Status	Married	31	30.7	34	33.7	36	35.6	101	84.2	0.35
	Unmarried	9	47.4	6	31.6	4	21.0	19	15.8	
Education	Illiterate	5	35.7	4	28.6	5	35.7	14	11.7	0.47
	Basic	17	34.0	14	28.0	19	38.0	50	41.7	
	Higher	18	32.1	22	39.3	16	28.6	56	46.6	
Occupation	Not working	11	32.4	12	35.3	11	32.3	34	28.3	0.32
	Public sect.	11	28.9	9	23.7	18	47.4	38	31.6	
	Private sect.	6	46.1	4	30.8	3	23.1	13	10.8	
	Technician	7	46.7	6	40.0	2	13.3	15	12.5	
	Professional	5	26.3	9	47.4	5	26.3	19	15.8	

Table 2: Effect of DASH diet on mean systolic and diastolic blood pressure readings among the study groups

Variables		Normotensive	Pre-hypertensive	Hypertensive	P. Value for mean change
Systolic Blood Pressure	Base line	105.3 ± 8.0	124.3 ± 5.0	146.0 ± 5.8	
	Final	102.0 ± 6.3	116.1 ± 5.7	129.6 ± 13.5	
	P. Value	0.47	<0.001	<0.001	
	Mean change	-3.3 ± 5.00	-8.1 ± 5.6	-16.4 ± 11.7	<0.001
Diastolic Blood Pressure	Base line	69.5 ± 4.5	80.8 ± 2.7	85.6 ± 5.5	
	Final	68.4 ± 3.6	75.0 ± 4.8	78.3 ± 6.7	
	P. Value	0.83	<0.001	<0.001	
	Mean change	-1.1 ± 2.1	-5.8 ± 4.2	-7.4 ± 7.1	<0.001

Figure 1: Follow up of mean systolic blood pressure, among study groups, during the duration of the study
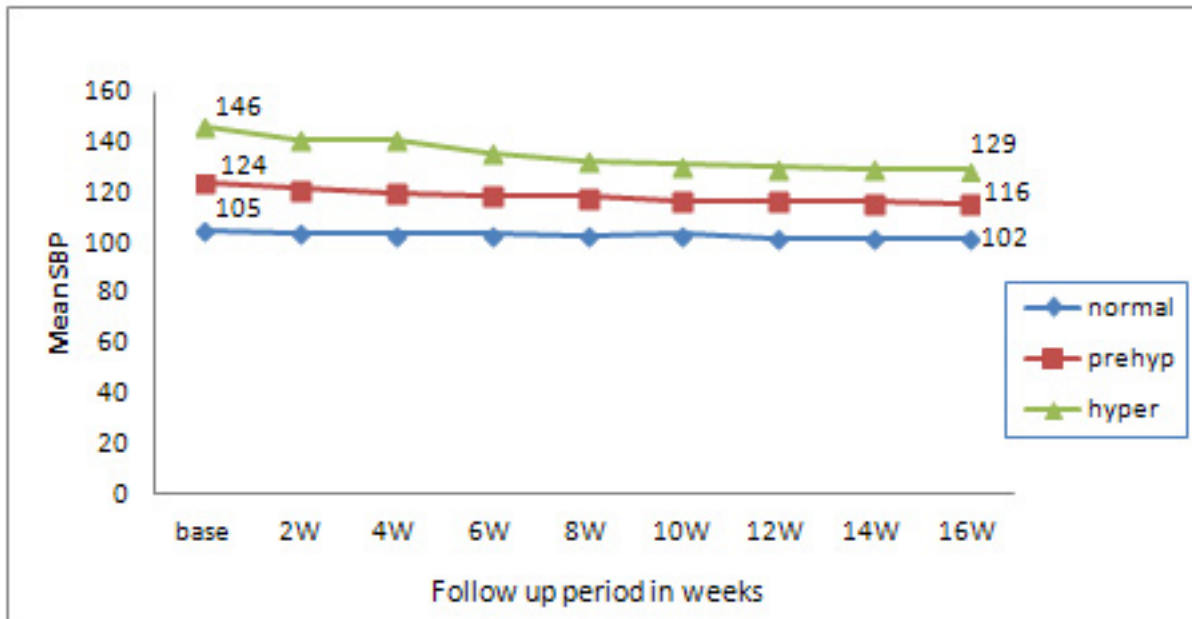
Figure 2: Follow up of diastolic blood pressure, among study groups during the duration of the study
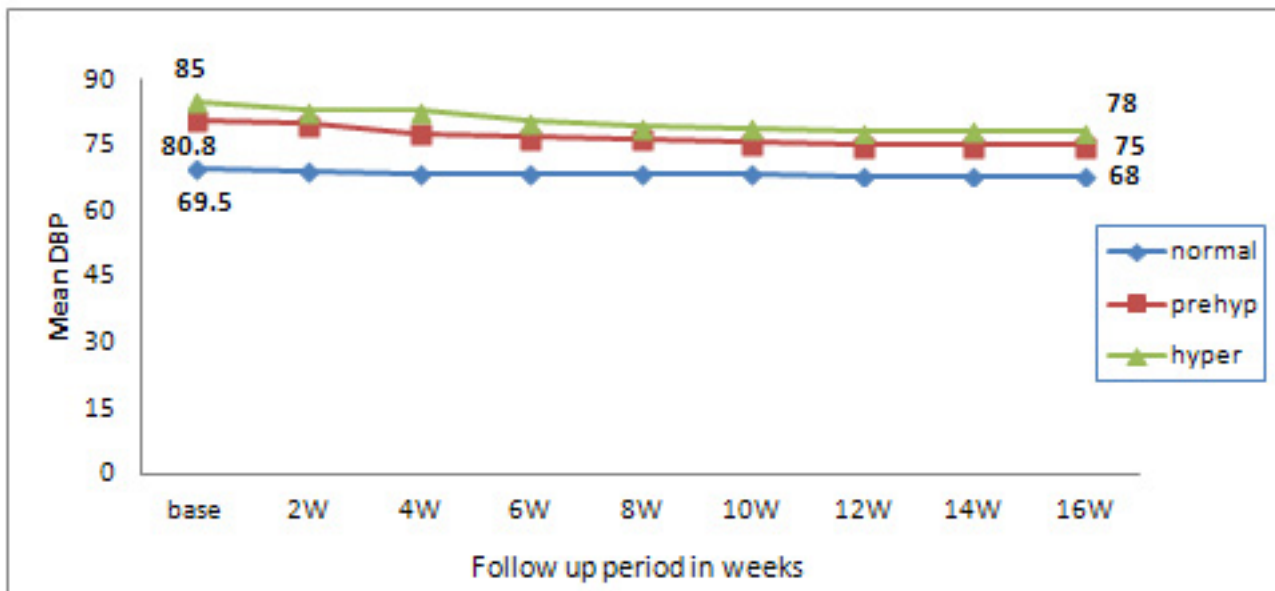
Table 3: Effect of DASH diet on waist circumference of males and females of the study groups

Waist circumference		Study groups			P. Value for mean change
		Normotensive	Pre-hypertensive	Hypertensive	
Male	Base line	97.6 ± 9.4	95.9 ± 10.4	102.1 ± 11.5	
	Final	96.3 ± 8.8	94.8 ± 10.6	100.1 ± 10.9	
	P. Value	0.70	0.76	0.58	
	Mean change	-1.3 ± 0.9	-1.1 ± 0.5 cm	-2.0 ± 0.8	0.33
Female	Base line	97.7 ± 14.2	103.0 ± 12.2	108.9 ± 16.7	
	Final	95.4 ± 21.9	100.7 ± 11.3	107.5 ±16.1	
	P. Value	0.29	0.50	0.69	
	Mean change	-2.3 ± 0.4	-2.3 ± 0.7	-1.4 ± 0.6	0.14

above 80 mmHg and reached 78.3 mmHg and 75.0 mmHg respectively, at the end of the study period with a plateau at 12 weeks.

The mean waist circumference (WC) among males in the normotensive group at base line was 97.6 ± 9.4 cm, and then became 96.3 ± 8.8 cm at the end of the study. Similarly WC was 95.9 ± 10.4 cm for the pre-hypertension group, that became 94.8 ± 10.6 cm, and was 102.1 ± 11.5 cm, then became 100.1 ± 10.9 cm for the hypertensive group [Table 3]. Although there was a slight mean decrease in the mean male WC of the base line reading by about 1.3 ± 0.9 cm, 1.1 ± 0.5 cm, 2.0 ± 0.8 cm in normotensive, pre-hypertension, hypertensive groups respectively, there was no statistically significant difference in the male waist circumference response. The mean WC for females at base line was 97.7 ± 14.2 cm, to end at 95.4 ± 21.9 cm for the normotensive group. As for the pre-hypertension group it was 103.0 ± 12.2 cm, that became 100.7 ± 11.3 cm, and it was 108.9 ± 16.7 cm, and became 107.5 ± 16.1 cm for the hypertensive group [Table 3]. A slight decrease in the mean female WC base line readings by 2.3 ± 0.4 cm, 2.3 ± 0.7 cm 1.4 ± 0.6 cm in normotensive, pre-hypertension, hypertensive groups respectively was found, however these findings were statistically insignificant. Similar findings with reductions in body weight and body mass index were detected although these were also statistically insignificant [Table 4].

Figure 3 shows the mean male WC readings for the study groups across the follow up period of the study. Both the hypertensive and the pre-hypertension groups started at above 97 cm and reached 100.1 and 96.3 cm respectively, at the end of the study period. Although the decrease in WC was insignificant, it continued throughout the 14 weeks.

Figure 4 shows the mean female WC readings for the study groups across the follow up period of the study. Both the hypertensive and the pre-hypertension groups started at above 103cm and reached 100.7 and 107.5 cm respectively, by the end of the study period. The decrease in WC was also insignificant but continued throughout the 14 weeks.

Discussion

The National Institutes of Health, in the USA, developed the Dietary Approaches to Stop Hypertension (DASH) eating plan, which has been shown to reduce blood pressure and body weight as well as prevent chronic diseases (12). This study explored the effects of a DASH diet intervention among three groups of Egyptian patients. Reductions in both systolic and diastolic blood pressure readings were found in all groups of normotensive, pre-hypertension and hypertensive grade 1 participants. However, reductions were significantly greater among the hypertensive grade I and pre-hypertensive group compared to the normotensive group.

These findings concur with results of Getchell et al, 1999 where 459 adults who were hypertensive and non-hypertensive were included and the study applied three types of diets: (1) a control diet with a nutrient composition typical of that consumed by Americans; (2) a DASH diet rich in fruits, vegetables, and low fat dairy products with a reduced amount of saturated fat, total fat, and cholesterol and a modestly increased amount of protein; and (3) a diet rich in fruits and vegetables but otherwise similar to the control diet. It was found that in comparison to the control group, blood pressure reduction was greater in those who were hypertensive on entry to the study. Additionally, for participants following the DASH diet, the amount of

Table 4: Effect of DASH diet on mean body weight and body mass index readings among the study groups

Variables		Study groups			P. Value for mean change
		Normotensive	Pre-hypertensive	Hypertensive	
Body Weight readings	Base line	79.7 ± 14.5	85.5 ± 13.4	94.0 ± 23.3	
	Final	77.5 ± 13.2	83.0 ± 12.5	91.2 ± 22.5	
	P. Value	0.96	0.90	0.99	
	Mean change	-2.2 ± 2.5	-2.6 ± 2.4	-2.7 ± 3.0	0.64
BMI readings	Base line	28.5 ± 4.8	30.4 ± 5.1	33.4 ± 8.2	
	Final	27.7 ± 4.2	29.5 ± 4.6	32.4 ± 7.9	
	P. Value	0.94	0.92	0.98	
	Mean change	-0.8 ± 0.9	-0.9 ± 0.9	-1.0 ± 1.0	0.67

Figure 3: Follow up of mean male waist circumference, by study groups
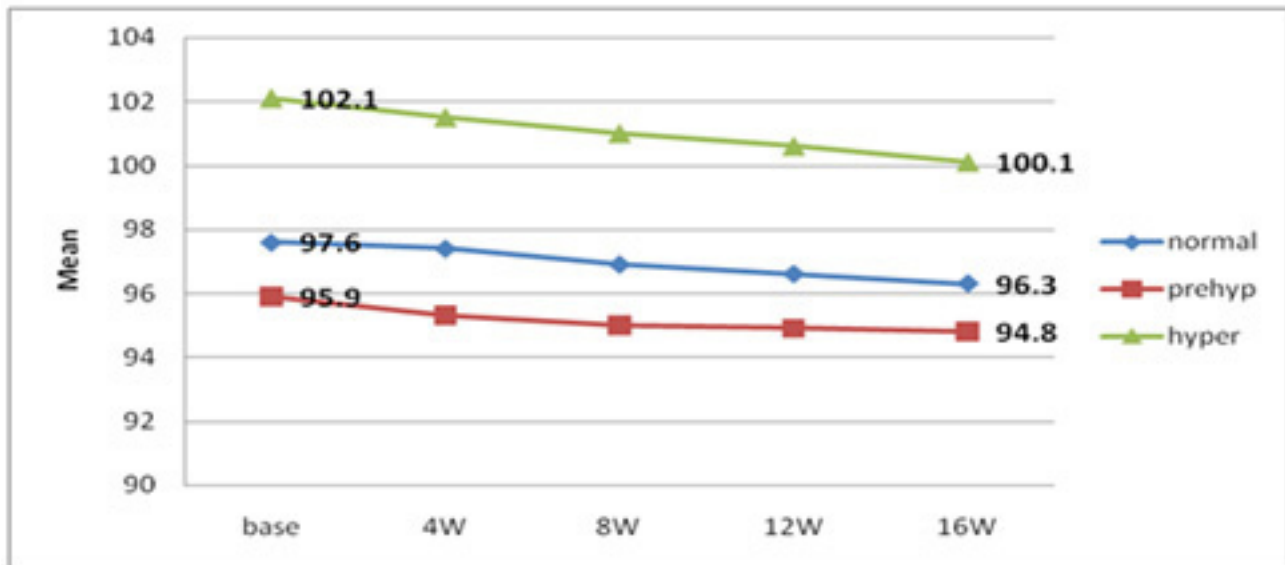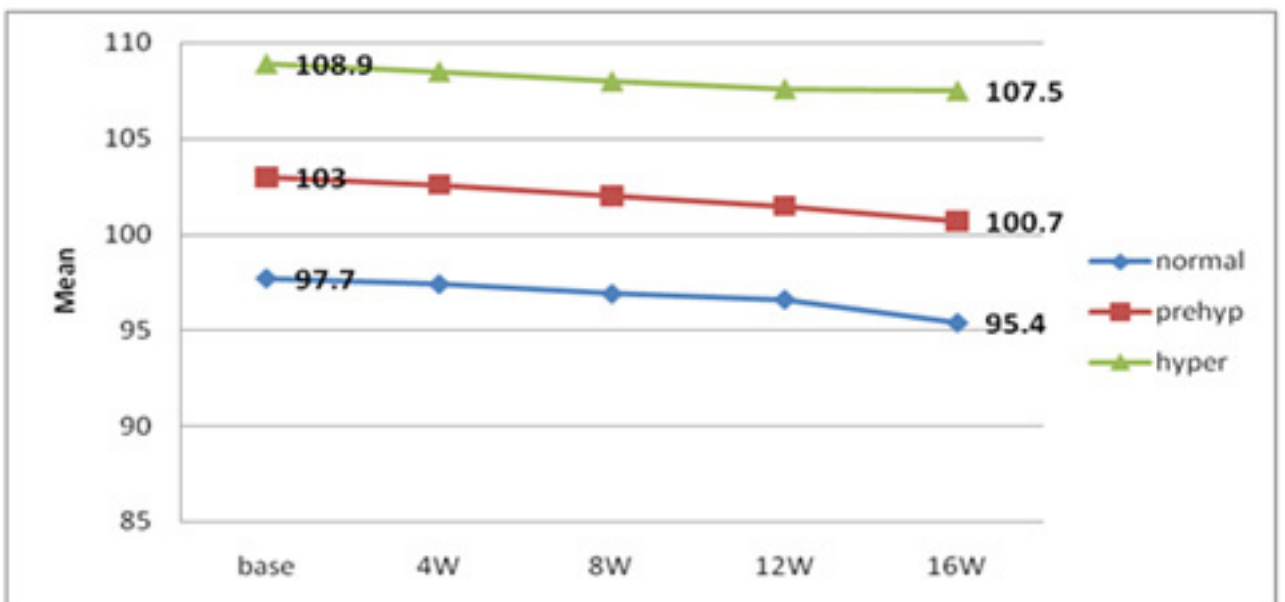

Figure 4: Follow up of female mean waist circumference, by study groups

blood pressure reduction increased significantly as baseline blood pressure increased (13). In addition, the study of Harnden et al, 2010 that applied a DASH diet for 30 days in the UK showed a weight reduction with an associated significant reduction in the mean systolic and diastolic blood pressure (14).

As regards the effect of DASH and time to reduction of both systolic and diastolic blood pressure, findings of our study showed major significant reductions in the BP among pre-hypertensive and hypertensive group 1 patients were greater in the first 8 weeks reaching a plateau after 12 weeks till the end of the study. Similar results were reported by Craddick et al, 2003 who found that DASH diet quickly and significantly reduces blood pressure, in comparison to the control (ordinary) diet among adults diagnosed as pre-hypertensive and hypertensive grade 1. These results were obtained without requiring participants to lose weight or reduce their sodium intake (15). Earlier

Vollmer et al, 2001 reported on proven strategies for reducing blood pressure as confirming the DASH diet, and reducing sodium intake among other strategies. Adopting each alone or in combination would reduce the risks of high blood pressure. However, this requires long-term commitment and significant lifestyle change to be effective (16). In 2007, Dauchet et al, found in a cross-sectional analysis, that measured intake of fruits, vegetables, and dairy products which are the components of DASH diet, are associated with a lowered systolic blood pressure by 1.5 mmHg and diastolic blood pressure by 1.4 mmHg (17).

In our study, there was a slight decrease in the mean WC in normotensive, pre-hypertension, hypertensive groups. Although this was insignificant yet it continued throughout the 14 weeks of the study. Additionally, slight reductions were also found regarding body weight and BMI following compliance to the DASH diet that although insignificant, may have also helped in reducing blood pressure among

study participants. Data from the ENCORE study suggest that the DASH eating plan alone lowers blood pressure in overweight individuals with high blood pressure, but significant improvements in insulin sensitivity are observed only when the DASH diet is implemented as part of a more comprehensive lifestyle modification program that includes exercise and weight loss (18). DASH is thus preferred as the initial approach to treating most individuals with uncomplicated higher than optimal blood pressure.

Conclusion

Various DASH studies have demonstrated that the total eating pattern, including sodium and other nutrients and foods, affects blood pressure and is also associated with a reduced risk of cardiovascular disease and lowered mortality (12, 19). This study provides evidence for the beneficial health outcomes among adults that have confirmed our intervention. Results have shown that DASH diet reduces blood pressure among all participants but with more effect among those with higher blood pressure levels. DASH diet as a monotherapy is known to be an effective and rapid initial treatment for patients with mild hypertension. As an intervention, it alleviates the cost and side effects associated with antihypertensive medications, ultimately improving a patient's quality of life. Therefore, the study recommends that family physicians begin with it as a first step for primary prevention or secondary prevention in mildly uncomplicated hypertensive patients and determine its efficacy after 8 -12 weeks. While other lifestyle modifications such as smoking cessation require greater time and personal effort, adherence to the DASH diet program can be encouraged through health education, enhancing family support and frequent counseling.

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Assessment of TB stigma among patients attending chest hospital in Suez Canal University area, Egypt

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Abstract

Background: TB stigmatization is a complex process involving institutions, communities, and inter- and intra-personal attitudes. While it has been recognized as an important social determinant of health and health disparities, the difficulties in identifying, characterizing, measuring, and tracking changes in stigmatization over time have made it challenging to justify devoting resource intensive interventions to the problem.

Objectives: To identify the magnitude and the burden of TB stigma on patient and effect of TB stigma on treatment adherence.

Methods: The data were collected between August and December 2014, recruiting all patients who had commenced treatment for up to a month. All patients were subjected to personal detailed interview according to a predesigned questionnaire after taking informed consent of the patients.

Results: A total of 53 patients consented to participate. The mean age ± SD was 43 ± 14.1 years. Out of the total number, 22.6% were illiterate and 77.4% were literate. As regards occupation, 69.8% were independent and 30.2% were dependent. The stigma prevalence among TB patients was found to be 41.5%. Stigma is more prevalent among the younger age group (43.5 %), males (43.9 %) and among married patients (46.7%). There was an immense stigma observed among urban residence (57.7 %), current smokers (60.0 %) and those who had two or less rooms in their house (66.7 %) and this was found to have a statistically significant difference (P<0.05). The majority of patients (67.9%) take treatment regularly.

Conclusion: TB stigma has been raised as a potential barrier to home and work-based direct observational therapy (DOT). Perceived TB stigma had no effect on treatment regularity. Health education programs should be conducted to reduce TB stigma and improve patients' compliance.

Key words : TB stigma, prevalence , treatment adherence

Introduction

Tuberculosis (TB) is believed to be nearly as old as human history. Traces of it in Egyptian mummies date back to about 7000 years ago, when it was described as phthisis by Hippocrates(1). It was declared a public health emergency in the African Region in 2005 and has since continued to be a major cause of disability and death(2). About 9.4 million new cases of tuberculosis were diagnosed in 2009 alone and 1.7 million people reportedly died from the disease in the same year, translating to about 4700 deaths per day (2). About one-third of the world's population (estimated to be about 1.75 billion) is infected with the tubercle bacillus(3). As much as 75% of individuals with TB are within the economically productive age group of 15 to 54 years. This significantly impairs socioeconomic development, thereby perpetuating the poverty cycle (4).

The social determinants of health refer to the institutional, community, and interpersonal factors that affect health outside of the ease with which an individual can access medical services (5). Stigma, which is shaped and promulgated by institutional and community norms and interpersonal attitudes, is a social determinant of health(6). Stigma is a process that begins when a particular trait or characteristic of an individual or group is identified as being undesirable or disvalued(7). The stigmatized individual often internalizes this sense of disvalue and adopts a set of self-regarding attitudes about the marked characteristic including shame, disgust, and guilt (8). These attitudes produce a set of behaviors that include hiding the stigmatized trait, withdrawing from interpersonal relationships, or increasing risky behavior (9-10).

Stigmatization is conceptually distinct from discrimination, another social determinant of health in that the primary goal of discrimination is exclusion, not necessarily for the target to feel ashamed or guilty(11-12). Stigmatized individuals can, however, suffer discrimination and status loss at the hands of the broader community, whose norms have caused them to be perceived as undesirable (7-13). Stigmatization is a complex process involving institutions, communities, inter- and intra-personal attitudes. While it has been recognized as an important social determinant of health and health disparities, the difficulties in identifying, characterizing, measuring, and tracking changes in stigmatization over time have made it challenging to justify devoting resource intensive interventions to the problem(6-14). One exception is human immunodeficiency virus (HIV)/acquired immunodeficiency syndrome (AIDS) research, where the interactions among stigma, HIV risk behaviors, and HIV associated outcomes have been fairly well characterized(15-16).

Substantially less study has been conducted on the mechanisms through which stigma impacts the health of individuals at risk for or infected with TB. From its introduction in 1994, DOTS has been the backbone of TB control around the world. With its focus on passive case detection, availability of diagnostic techniques, and directly observed therapy to minimize drug resistant TB, DOTS has been criticized as a treatment guideline and biomedical strategy that does not account for social factors related to TB control rather than a comprehensive control plan (17-18).

Delay in presentation to a health facility is an important concern as it contributes to delays in initiating TB treatment. This can result in greater morbidity and mortality for the patient and increased transmission of Mycobacterium tuberculosis in the community(19-20). There is a large body of literature on factors associated with delay in seeking care for TB symptoms. These can be broadly grouped into access to care, personal characteristics, socioeconomic, clinical, TB knowledge or beliefs, and social support or psychosocial factors(21). One psychosocial factor of interest is health-related stigma, often defined as a social process "characterized by exclusion, rejection, blame, or devaluation resulting from experience or reasonable anticipation of an adverse social judgment" because of a particular health condition (22). Some studies have suggested that TB stigma could lead to delays in patients seeking appropriate medical care (19-23).

Aim of the study

To highlight the importance of psychosocial factor on TB stigma, aiming to improve the quality of care for TB patients.

Objectives

To identify the magnitude and the burden of TB stigma on patients received TB treatment and to determine socio demographics factors associated with TB stigma.

Methodology

This was a cross sectional study conducted at two government health institutions providing TB services in the Suez Canal area. The treatment regimens used throughout the country are based on the World Health Organization's (WHO) Directly Observed Treatment, ShortCourse (DOTS) strategy. The data were collected between August and December 2014, recruiting allpatients who had commenced treatment for up to a month. All patients were subjected to personal detailed interview according to a predesigned questionnaire after taking informed consent of the patients. Before conducting the study, the questionnaire was pre-tested and evaluated for proper conduct of the study.

The information was elicited from TB patients regarding 'problems faced in their homes, neighbours' attitudes and friends. Questionnaire included questions regarding data on socioeconomic issues and awareness of TB and the nature of their disclosure of their disease to family members. The information was also elicited regarding behavioral changes such as maintaining appropriate personal distance and avoiding close contact in activities with family members, neighbours, friends and other fellow employees.

The data were entered, cleaned and analyzed using SPSS software version 18.0. Descriptive statistics like frequency distribution and percentage calculation was made for most of the variables. Chi square test and proportion tests were used to assess significance. A value of $p<0.05$ was taken as significant.

Ethical Considerations

The study subjects were explained the purpose of study and assured privacy. Confidentiality and anonymity were maintained according to the regulations mandated by Research Ethics Committee of Faculty of Medicine Suez Canal University (no.2357).

Result

Table 1: Distribution of the study group according to Socio-demographic characteristics

Socio-demographic characteristics	No.	%
Age (yrs)		
< 30	14	26.4
30-50	20	37.7
> 50	19	35.8
Mean ± SD		43 ± 14.1
Education		
Illiterate	12	22.6
Read & write	17	32.2
Primary & preparatory	12	22.6
Secondary, technical, University	12	22.6
Occupation		
Independent	40	75.5
Dependent	13	24.5
Occupational type (n= 40)		
Professional	1	1.9
Intermediate	6	11.3
Skilled	3	5.7
Semiskilled	7	13.2
Unskilled	23	43.4
Smoking habits		
Non-smoker	33	62.3
Smoker	20	37.7
Mean ± SD of cigarettes numbers /day		18.24 ± 17.1
Mean ± SD of smoking duration (years)		21.50 ± 12.1

A total of 53 patients consented to participate. The socio-demographic profile of TB patients is presented in Table 1. The mean age ± SD was 43 ± 14.1 years. Out of the total number, 22.6% were illiterate and 77.4% were literate. As regards occupation, 69.8% were independent and 30.2% were dependent. There were more male cases (77.4 %) than female (22.6%). Approximately half of the cases were married (56.6 %) and the majority had appropriate family income (64.2%).

Table 2: Clinical profile of the study population

Clinical profile	No.	%
Presence of chronic disease		
Yes	15	28.3
No	38	71.7
TB		
Pulmonary	43	81.1
Extra-pulmonary	10	18.9
Investigations		
Sputum	53	100
(+) result	40	75.5
(-) result	13	24.5
Chest X-ray	30	56.6
Blood	21	39.6
Family investigations		
Yes	20	37.7
No	33	62.3
Take TT regularly		
Yes	36	67.9
No	17	32.1
TT duration (months)		
< 1	19	35.8
1-6	24	45.3
>6	10	18.9

Figure 1: Association between TB symptoms and stigma

Table 3: Prevalence of TB stigma
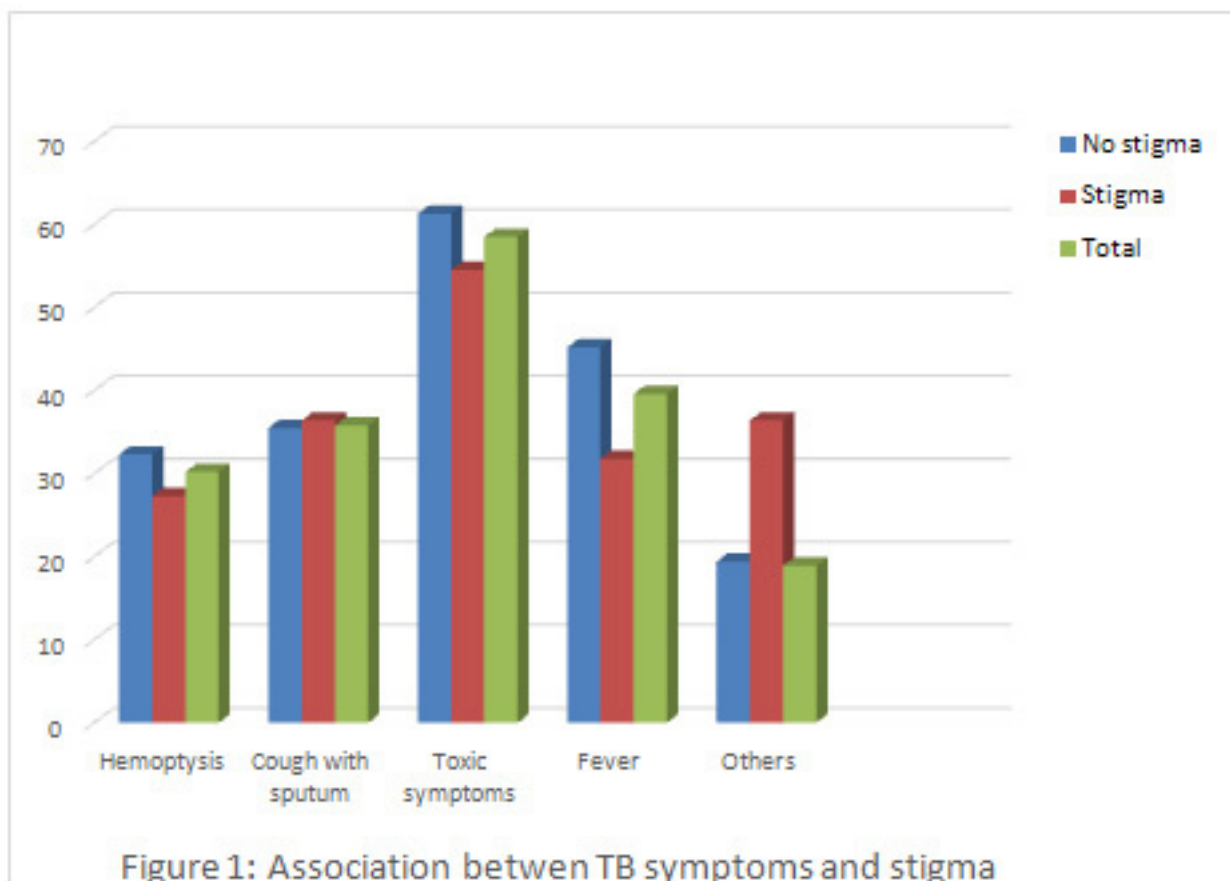
Stigma	N	%
Experienced	22	41.5
Not- Experienced	31	58.5
Total	53	100

Table 4: Association of risk factors and TB stigma

Variables	TB stigma				X²	P-value
	No (n= 31)		Yes (n= 22)			
	N	%	N	%		
Age						
≤ 40	13	56.5	10	43.5	0.06	> 0.05
> 40	18	60.0	12	40.0		
Gender						
Male	23	56.1	18	43.9	0.42	> 0.05
Female	8	66.7	4	33.3		
Residence						
Urban	11	42.3	15	57.7	5.5	
Rural	20	74.1	7	25.9		< 0.05*
Marital status						
Married	16	53.3	14	46.7	0.75	> 0.05
Non-married	15	65.2	8	34.8		
Education						
Illiterate	7	58.3	5	41.7	0.00	> 0.05
Literate	24	58.5	17	41.5		
Occupation						
Dependent	23	62.2	14	37.8	0.68	> 0.05
Independent	8	50.0	8	50.0		
Family members						
≤ 5	19	54.3	16	45.7	0.75	> 0.05
> 5	12	66.7	6	33.3		
Family income						
Non-Appropriate	11	57.9	8	42.1	0.04	> 0.05
Appropriate	20	58.8	14	41.2		
N° of house room						
≤ 2	7	33.3	14	66.7	9.06	< 0.05*
> 2	24	75.0	8	25.0		
Current smokers						
Yes	8	40.0	12	60.0	4.52	< 0.05*
No	23	69.7	10	30.3		

As regards clinical profile of the study population, 81.1% had pulmonary TB and 75.5% had positive sputum smear. The majority of patients (67.9 %) take treatment regularly as presented in Table 2. Toxic symptoms were the most prevalent among TB patients (58.5 %) followed by fever (39.6 %) and cough with sputum (35.8 %) (Figure 1).

The stigma prevalence among TB patients was found to be 41.5% (Table 3). Stigma is more prevalent among younger age groups (43.5%), males 43.9% and among married patients (46.7%). There was an immense stigma observed among urban residence (57.7%), current smokers (60.0 %) and those who had two or less rooms in their house (66.7%) and this was found to be a statistically significant difference (P<0.05)(Table 4).

Table 5: Distribution of stigma score of TB patients according to community perspectives

Items	No (%)	Uncertain (%)	Possibly (%)	Yes (%)
Some people may not want to eat or drink with you	58.4	1.9	5.7	34.0
Some people feel uncomfortable about being near you	52.8	1.9	7.5	37.8
Some people don't want your child playing with their children	56.6	1.9	5.7	35.8
Some people keep their distance from you	54.7	3.8	9.4	32.1
Some people think that you are disgusting	60.3	3.8	3.8	32.1
Some people do not want to talk with you	58.4	1.9	5.7	34.0
Some people are afraid of you	56.6	1.9	5.7	35.8
Some people try not to touch you	52.8	5.7	5.7	35.8
Some people may not want to eat or drink with you	54.7	1.9	9.4	34.0
Some people prefer not to have those with TB living in their community	58.5	1.9	3.8	35.8
Doctors fear to approach you	84.9	0	0	15.1
Nurses deal with you very conservatively	84.9	0	0	17.0

Stigma faced in community by TB patients: About one third of TB patients reported that some people prefer not to have those with TB living in their community and 35.8% reported that some people don't want their children to play with a TB patient's child (Table 5).

Table 6: Distribution of stigma score of TB patients according to patient perspectives

Items	No (%)	Uncertain (%)	Possibly (%)	Yes (%)
You feel hurt by how others react to knowing you have TB	43.5	5.7	9.4	41.5
Do you lose friends when you share with them that you have TB?	58.5	3.8	1.9	35.8
Do you feel lonely?	50.9	3.8	5.7	39.6
Do you keep distance from others to avoid spreading TB germs?	35.8	1.9	56.6	5.7
Are you afraid to tell persons outside your family that you have TB?	47.2	1.9	9.4	41.5
Are you afraid of going to TB clinics because other people may see you there?	67.9	1.9	1.9	28.3
Do you choose carefully who you tell about having TB?	50.9	0.0	0.0	49.1
Do you feel guilty because your family has the burden of caring for you?	47.2	1.9	3.8	47.1
Do you feel guilty for getting TB because of your careless behaviors as smoking?	60.4	1.9	7.5	30.2
Are you afraid to tell your family that you have TB?	75.5	0.0	3.8	20.7

Perceived Stigma among TB patients: Out of a total of 53 patients 41.5% reported feeling hurt by how others react to knowing that they have TB and 35.8% lose friends when they share with them that they have TB. Being afraid of going to TB clinics because other people may see them was reported by 28.3% of TB patients. While about half of the patients, 47.1%, felt guilty because their family has the burden of caring for them (Table 6).

Discussion

Globally, 14.6 million people have active TB disease. Each year 8.9 million people develop active TB(24). Patients often isolate themselves to avoid infecting others and to avoid uncomfortable situations such as being shunned or becoming the subject of gossip (25). Hence, the aim of this study was to improve the quality of life of TB patients by identifying the magnitude and the burden of TB stigma on patients. Results of the current study indicated that the majority of the study sample were men (77.4 %); the same results were supported by Aryal(26).

Approximately half of the cases were married (56.6 %) and the majority were literate and this is in agreement with Abioye et al. (27). However this was not supported in a study in Bangladesh where the majority of patients had not received any formal education and this is due to the difference in culture and socioeconomic characteristics(28). Our study shows also that the majority had appropriate family income (64.2%) which matches the urban community where the study took place.

Results showed that 41.5% of the TB patients had experienced stigma; similar results were found in Nepal (63.3%)(26). The same prevalence was found in a study conducted in southern Thailand by Rie AV, which shows that stigma is present in patients' perspective towards TB (29).

Several studies suggest that health-care providers and at-risk community members perceive TB stigma to have a more substantial impact on women's health-care-seeking behavior than on men's(30). However this disagrees with the study results in which stigma was slightly more prevalent among men. This is because most women in our community do not work and do not come in direct contact with community members such as men. In another study work-related aspects of stigma were frequently reported, and they were more likely to be an issue for men (28). In urban areas, there may be more fears of being discriminated in the work environment, or of losing jobs. This explains the study results that show that immense stigma observed among urban residence.

Abioye et al, 2011 found that patients presenting with previous smoking history were more likely to experience stigma in a study in Lagos, Nigeria (27) and this also can be found in this study, where there is a statistically significant relation between stigma and smoking.

Abioye et al.(2011), studied stigma among patients with pulmonary tuberculosis in Lagos, Nigeria. They found that limited education and patients who are in the working age groups (20 to 50 years) had TB stigma. However according to the current study results, no statistically significant association could be revealed between these two sociodemographic determinants.

TB stigma has been raised as a potential barrier to home- and work-based direct observational therapy (DOT) (31). Perceived TB stigma was also associated with noncompliance among Pakistani patients on DOT (32). However, this study shows an insignificant relation between TB stigma and regularity of TB treatment and this may have contributed to the effect of TB-related stigma and social discrimination on the patients that forces them to be compliant to drugs so that they can avoid the stigmatization.

Although several survey instruments are in development for measuring perceived and internalized TB stigma, most research uses qualitative techniques for assessing TB stigma. The use of different measurement tools may explain why TB stigma is a predictor of diagnostic delay and treatment nonadherence in some studies and not in others(33). In this study Toxic symptoms were the most prevalent among TB patients (58.5 %) followed by fever (39.6 %) and cough with sputum (35.8 %), but the relation between TB symptoms and stigma were not statistically significant as most stigmatized TB patients usually do not disclose their symptoms as this increases the state of discrimination in their life; they want to hide their symptoms from others.

Some of the patients also revealed that they go to the DOTS center which is farther from their home so that nobody knows that they are taking TB drugs (26).

In this study 35.8% lose friends when they share with them that they have TB. This is in agreement with another study conducted in southern India that showed that many men felt inhibited from revealing the diagnosis to friends (43%) and even to their spouse (16%) (34). The study results shows that 41.5% reported feeling hurt by how others react to knowing that they have TB and 35.8% lose friends when they share with them that they have TB. This was revealed in another study in India where most of the patients said that they have impaired self-esteem, felt shamed or embarrassed, and have felt less respect from others in the society (34). Another study conducted revealed that TB patients perceive their neighbors and friends attitudes towards them as rather negative (35)which was in agreement with this study.

Conclusion

TB stigma has been raised as a potential barrier to home- and work-based direct observational therapy (DOT) (31). Health education programs should be conducted to reduce TB stigma and improve patients' compliance.

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Awareness of diabetic retinopathy in Egyptian diabetic patients attending Kasr Al-Ainy outpatient clinic: A cross-sectional study

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Abstract

Background: Diabetic retinopathy (DR) is a sight-threatening microvascular complication of diabetes.

Objectives: The objectives of this study were to assess the awareness of diabetic patients about the screening for diabetic retinopathy and to detect the presence of different stages of retinopathy among a sample of patients attending the Diabetic clinic in Kasr Al-Ainy hospital.

Methods: This study is a cross sectional study in which 100 adult diabetic patients were interviewed and visual acuity, retinopathy status, and presence of other ocular diseases were assessed.

Results: It was found that there is general awareness of diabetic retinopathy among the majority of the study participants; however there is little awareness as regards the importance of screening. The main barrier for performing fundus examination was lack of awareness of its importance. Around half of the participants had performed one fundus examination after diagnosis of diabetes. Ophthalmic examination revealed that 47% of the study participants had no DR at the time of the examination, 22% had non-proliferative retinopathy and 31% had proliferative retinopathy. Only 16% of the participants had diabetic maculopathy.

Conclusion: Awareness creation is crucial for decreasing diabetic eye complications.

Key words: Egypt, diabetic retinopathy, awareness, fundus examination, screening.

Introduction

Diabetes is a complex, chronic illness requiring continuous medical care with multifactorial risk-reduction strategies beyond glycemic control (1). The International Diabetes Federation (IDF) in 2013 estimated that there were 382 million diabetic patients worldwide; 80% of them lived in low- and middle-income countries and the number will increase to be 592 million by the year 2035. The Diabetic population in Egypt was estimated to be 7.5 million in 2013 and it is projected to reach 13.1 million by the year 2035 (2).

Diabetic retinopathy (DR) and diabetic macular edema (DME) are common microvascular complications of diabetes and may have a debilitating impact on visual acuity, eventually leading to blindness. Other eye disorders including glaucoma and cataracts occur earlier and more frequently in people with diabetes. The current management strategy for DR/DME requires early detection and optimal glycemic control to slow the progression of disease (3).

An initial dilated and comprehensive eye examination should be performed shortly after the diagnosis for all type 2 diabetic patients. Subsequent examinations for type 1 and type 2 diabetic patients should be repeated annually in the absence of retinal changes, otherwise shorter intervals are recommended (4).

Having a high prevalence of diabetes and its complications in Egypt, there is a strong need to assess the awareness of consequences or the end organ damage due to diabetes mellitus among diabetics. In addition, there is a great need to estimate the likelihood of diabetics to seek medical advice for the assessment of the consequences of diabetes, like diabetic retinopathy. Therefore, in our study, we have made an attempt to assess the awareness of diabetic retinopathy and detect the retinopathy changes among a sample of diabetic patients.

Methods

This cross-section observational study was conducted in the Diabetic Clinic in Kasr Al-Ainy hospital from February 2011 till February 2012.

Sample selection:
Purposive non-probability sampling technique was used in which 100 diabetic patients attending the Diabetic Clinic in Kasr Al-Ainy hospital were included in the study. All adult patients with type 2 diabetes who agreed to participate were enrolled in the study. Any patient with other ophthalmic diseases obscuring retinal view or affecting the quality of digital photography was excluded from the study.

Study tool
A structured questionnaire was designed to assess patient awareness regarding the importance of screening for DR, its frequency and causes of non-adherence. The content validation of the questionnaire was done by two experts. The questionnaire was tested on 10 diabetic patients in order to check the clarity of the structured questionnaire and to estimate the time needed to complete the questionnaire. It was found that most of the patients were illiterate, so the questionnaire could not be self-administered and was completed by interviewing.

Data collection
The first step:
Following consent, participants completed an interview, that included:

- Demographic characteristics including: Age, gender, marital status, number of children, level of education, employment status, insurance and its type.
- Medical data including: Smoking status, previous eye diseases and operations, age of onset of diabetes, its duration and treatment.
- Self-perception regarding diabetes control.
- Chronic diseases and drug intake including aspirin and vitamin B complex.
- Family history of diabetes.
- Previous fundus examination including: Frequency, time of first and last fundus examination and causes of non-adherence to previous fundus examination.
- The awareness of the patients including: awareness about diabetic complications, awareness about the importance of screening of DR, available treatment options for DR and the source of their knowledge.

The second step:
Complete ophthalmological examination was done including:
- Visual acuity measurement: using WHO classifications for grading of VA, which classified to, in the best eye (WHO, 1992):

- Blindness: < 3/60.
- Severe visual impairment: <6/60 - 3/60.
- Visual impairment: <6/18 - 6/60.
- Normal: 6/6 - 6/18.

- Anterior segment examination by slit-lamp and measurement of the intra-ocular pressure using applanation tonometry.
- Fundus examination using indirect-ophthalmoscope was done to reveal peripheral abnormalities. A fundus camera (Topcon, USA) was used to take colored fundus photographs and fluorescein angiography. Photographs were evaluated for the presence of non-proliferative DR, proliferative DR, clinically significant macular edema and previous retinal laser treatment. Overall retinopathy and maculopathy levels were assessed based on the International Clinical Diabetic Retinopathy and Diabetic Macula Edema Disease Severity Scale (6).

The third step:
Blood glucose measurement was done either by fasting blood sugar, 2 hour post prandial or HBA1c to assess the state of diabetes control.

Statistical analysis

The data were coded and entered using the statistical package for social science (SPSS) version 15. The data were summarized using descriptive statistics: mean, standard deviation, minimum and maximum values for quantitative variables, number and percentage for qualitative variables. Statistical difference between groups was tested using: Chi square test, independent sample test and ANOVA test while non-parametric tests were used for quantitative variables which were not normally distributed. P value less than 0.05 was considered statistically significant. Pearson's correlation coefficient was used to assess the correlation between the quantitative variables. Correlation was mild if correlation coefficient (r) was less than 0.3, moderate if $0.7 > r > 0.3$, powerful if more than 0.7.

Ethical approval

Ethical approval was obtained from the Research Committee of Cairo University. Informed written consent was taken from all participants after explaining the steps of the study to them.

Methods

Around half of the participants were 50 to 60 years old and 71% of them were females. Seventy percent of the participants were illiterate and 74% were unemployed. Most of the study participants (88%) had no health insurance (Table 1).

Table 1: Socio-demographic characteristics of the diabetic patients attending diabetic clinic in 2011

Variable	Number (100)	Percent (%)
Age group (years):		
30 -	3	3
40 -	24	24
50 -	52	52
≥60	21	21
Gender:		
Male	29	29
Female	71	71
Marital status:		
Married	90	90
Widow	5	5
Single	3	3
Divorced	2	2
Number of children for married patients (total= 97):		
0-1	5	5.2
2-5	62	63.9
>5	30	30.9
Education:		
Illiterate	70	70
Not completing primary (read & write)	5	5
Primary and preparatory	10	10
Secondary	8	8
Above secondary	7	7
Work:		
Not working	74	74
Working:	26	26
• Employee	6	6
• Manual Worker	20	20
Health insurance:		
Has no insurance	88	88
Has insurance	12	12
Smoking:		
Non smoker	86	86
Smoker	14	14

Figure 1: Reasons stated by the study participants for not attending for the screening of DR
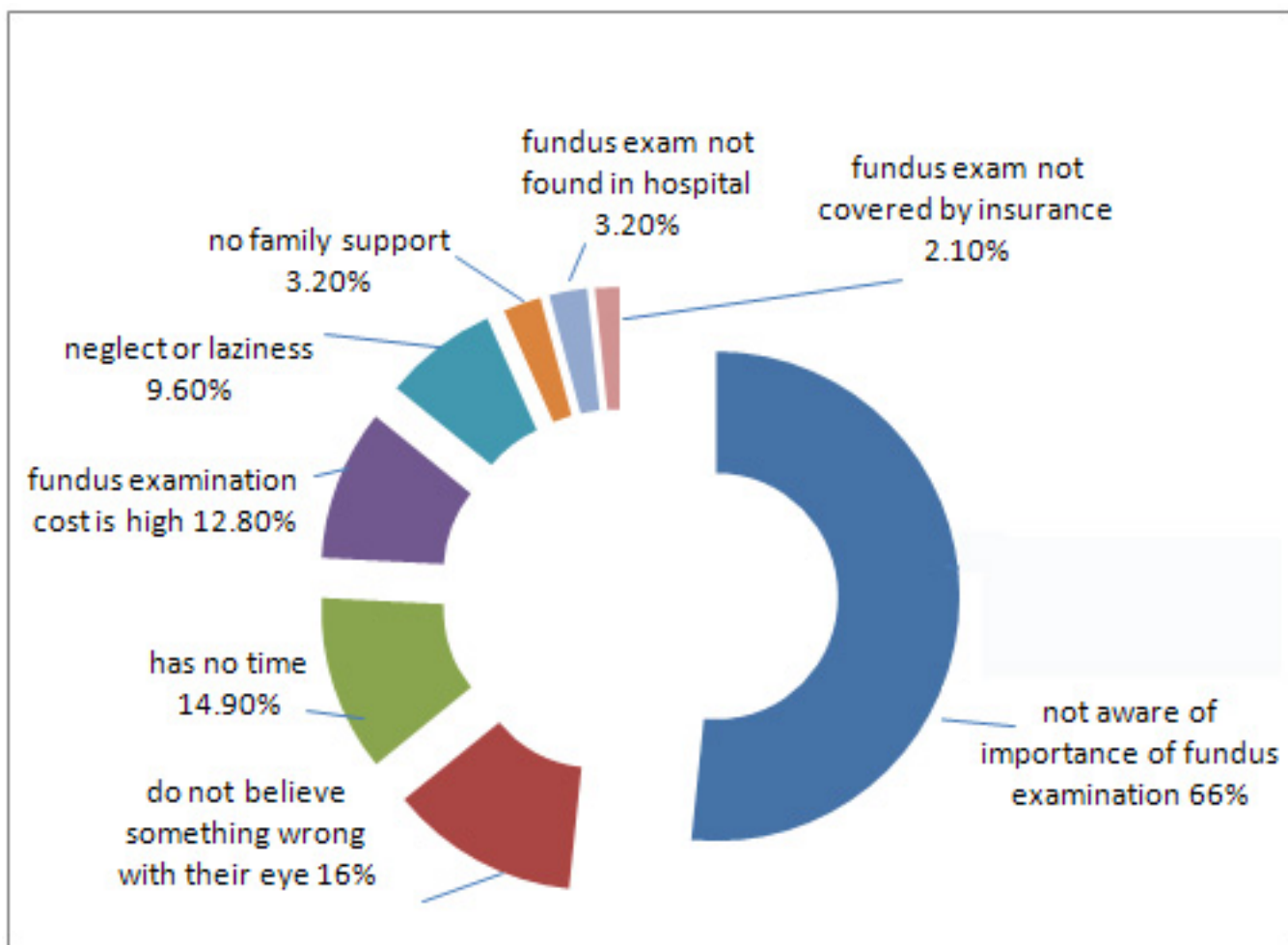
The range of age of onset of diabetes was from 34 - 68 years; the mean was 44.24 ± 7.94 years. The range of the duration of diabetes was from 0.5 to 30 years; the mean was 11.13 ± 6.61 years. Family history of diabetes was positive in 65% of the participants.

Around half of the participants (51%) were taking anti-hyperglycemic drugs for control of diabetes; 22% were on insulin and 27% were on combined insulin and oral hypoglycemic drug. Vitamin B complex was taken by only 26% of the participants for associated diabetic neuropathy, and only 9% of them were taking Aspirin for associated ischemic heart diseases.

Regarding history of previous ophthalmic diseases, thirty-six percent had history of cataract (33 of them were treated by cataract operation), 16% had history of retinal affection (treated by retinal laser or injection), 16% had recurrent eye infections, 4% had glaucoma and 2% had pterygium.

Awareness regarding diabetes complications
Most of the participants (79%) were aware of diabetic complications on various body organs while 85% of them were aware of diabetes complications on the eye. From those, 38.8% of the participants were aware that diabetes may cause blindness or diminution of vision, 35.3% were aware that diabetes may cause retinal affection and 31.8% were aware that diabetes may cause cataract. Only 10.6%

and 5.9% mentioned glaucoma and recurrent eye infections as eye complications of diabetes. Less than half of them (42.4%) didn`t know what the exact effect of diabetes on the eye is, although they knew that diabetes affects the eye. Table 2 shows the relation between awareness of diabetic eye complications and some variables.

Awareness regarding screening of DR
Most of the participants were not aware of the importance of frequent screening of DR (75%), while 20% of them didn't know the routine screening frequency. When asked about the importance of regular screening for DR in well-controlled diabetes, 65% stated that they did not know, while 15% of the participants thought that there is no need. Most of the participants didn't know whether there is available treatment for DR or not (88%).

The sources of the participants' knowledge were mainly from the physicians (71%); the ophthalmologist (27.3%), the family physician (21.6%), the endocrinologist (18.2%) and the internal medicine specialist (13.6%). The patients' friends or relatives were the second source of their knowledge (20.5%). Mass media had a less important role in their knowledge (11.4%).

Only 67% of the participants attended for previous fundus examination (Table 3). From those, 7.5% did fundus examination at the time of diagnosis of diabetes while 41.8%

Table 2: Relation between awareness of diabetic eye complications and importance of screening and some variables

Awareness	Aware of diabetic eye complications (total= 100)					Aware of importance of screening of DR (total= 100)					Total
	Not-aware (total= 15)		Aware (total= 85)		P value	Not-aware (total= 75)		Aware (total= 25)		P value	
	No.	%	No.	%		No.	%	No.	%		
Age (years):											
30 - <40	1	33.3	2	66.7	0.8	3	100	0	0	0.6	3
40 - <50	3	12.5	21	87.5		17	70.8	7	29.2		24
50 - <60	8	15.4	44	84.6		38	73.1	14	26.9		52
≥ 60	3	14.3	18	85.7		17	81	4	19		21
Gender:											
Male	2	6.9	27	93.1	0.2	24	82.8	5	17.2	0.2	29
Female	13	18.3	58	81.7		51	71.8	20	28.2		71
Education											
▪ Illiterate	13	18.6	57	81.4	0.3	54	77.1	16	22.9	0.2	70
▪ Not completing primary	0	0	5	100		2	40	3	60		5
▪ Primary & preparatory	2	20	8	80		9	90	1	10		10
▪ Secondary	0	0	8	100		5	62.5	3	37.5		8
▪ Above secondary	0	0	7	100		5	71.4	2	28.6		7
Family History											
Negative	6	17.1	29	82.9	0.6	30	85.7	5	14.3	0.06*	35
Positive	9	13.8	56	86.2		45	69.2	20	30.8		65
Retinal affection or treatment					0.1					0.1	
No	15	17.9	69	82.1		66	78.6	18	21.4		84
Yes	0	0	16	100		9	56.3	7	43.8		16
Treatment											
▪ OHG**	10	19.6	41	80.4	0.03*	38	74.5	13	25.5	0.2	51
▪ Insulin	5	22.7	17	77.3		19	86.4	3	13.6		22
▪ Combined insulin& OHG	0	0	27	100		18	66.7	9	33.3		27
Control of diabetes											
Not-controlled	7	10	63	90	0.02*	48	68.6		31.4	0.02*	70
Controlled	8	26.7	22	73.3		27	90		10		30

* P value significance <0.05; **OHG: oral hypoglycemic drugs

had the fundus examination 10 years later. The time of 1st fundus examination was directly proportionate to both the age of the participants (**P value: 0.01, person correlation: 0.29**) and duration of diabetes (**P value: <0.001, person correlation: 0.91**), and inversely proportionate to age of onset of diabetes (**P value: <0.001, person correlation: -0.48**) and these data were statistically significant.

Around half of the participants (50.7%) had performed one fundus examination after diagnosis of diabetes. The number of fundus examinations was directly proportionate to both HBA1C (P value: 0.04, person correlation: 0.48), and degree of DR (P value: 0.01, person correlation: 0.31) and these data were statistically significant.

Ophthalmic examination
Ophthalmic examination revealed that 11% of the participants were blind, 6% had severe visual impairment, 46% percent had visual impairment and 37% were normal. Also, 54% of the participants had cataract and 2% had glaucoma at the time of the examination.

Around half of the study participants (47%) had no DR at the time of the examination, 22% had non proliferative retinopathy and 31% had proliferative retinopathy. Only 16% of the participants had diabetic maculopathy. Table 4 shows that 65% of males and 47.9% of females were affected by DR while 51.7% and 22.5% had proliferative retinopathy respectively and these findings were statistically significant.

Regarding the effect of smoking, 29.1% of non-smokers and 42.9% of smokers had proliferative retinopathy. On the other hand, 56.9% of the participants who were taking

OHD had no DR, and 92.2% of them had no diabetic maculopathy. More than half of the participants (56.7%) who were well-controlled had no retinopathy and the majority of them (90%) had no maculopathy. The prevalence of DR in both hypertensive and non-hypertensive participants was nearly equal. But all these data were statistically insignificant.

DR was directly proportionate to duration of diabetes (P value: 0.01, person correlation: 0.29), and inversely proportionate to age of onset of diabetes (P value: 0.03, person correlation: -0.24) and these data were statistically significant.

Figure 2 (page 28) shows a sample of the result of fundus examination done to the study participants. Figure 2-A belongs to a 55-year-old male patient with 16-year-duration of type 2 diabetes. His last fundus examination was 11 years ago. His fundus picture reveals proliferative retinopathy. On the other hand, Figure 2-B belongs to a 56-year-old male patient with 7-year-duration of type 2 diabetes. He has not performed any fundus examination before. His fundus picture reveals non proliferative retinopathy with diffuse macular edema.

Perception gap of diabetes control
Regarding self-perception of diabetes control, 41% of the participants thought that they were controlled, 32% of the them thought that they were not controlled, 24% of them stated that they were sometimes controlled and only 3% of them stated that they didn't know whether their blood glucose was controlled or not.

Table 3: Causes of patients' attendance for previous fundus examination and frequency of their fundus examination (diabetic clinic in 2011)

Previous fundus examinations	No. (total=67)	%
Causes of previous fundus examination:		
Retinal assessment or treatment	33	49.3
Other causes	34	50.7
Time of 1st fundus examination after diagnosis of diabetes:		
At onset of diagnosis	5	7.5
Within 1st year	2	2.9
>1-5 years	10	14.9
>5-10 years	22	32.8
> 10 years	28	4.8
Number of fundus examinations:		
1 time	34	50.7
2-10 times	26	38.8
11-24 times	7	10.4
Time of last fundus examination (before this study):		
3 years ago	2	3
2 years ago	9	13.4
1 year ago	10	14.9
6 months ago	46	68.7

Table 4: Effect of some variables on diabetic retinopathy of diabetic patients attending diabetes clinic in 2011

Retinopathy	Retinopathy (total= 100)					Maculopathy (total= 100)			Total
	R_0 (total= 47)	R1 (total= 14)	R2 (total= 8)	R3 (total= 31)	P value	M_0 (total= 84)	M_1 (total= 16)	P value	
Gender:									
Male No.	10	2	2	15	.03*	25	4	1.0	29
%	34.5	6.9	6.9	51.7		86.2	13.8		100
Female No.	37	12	6	16		59	12		71
%	52.1	16.9	8.5	22.5		83.1	16.9		100
Smoking:									
Not-smoker									
No.	43	12	6	25	0.4	73	13	0.6	86
%	50	14	7	29.1		84.9	15.1		100
Smoker									
No.	4	2	2	6		11	3		14
%	28.6	14.3	14.3	42.9		78.6	21.4		100
Diabetic treatment:									
OHD									
No.	29	6	5	11	0.1	47	4	0.6	51
%	56.9	11.8	9.8	21.6		92.2	7.8		100
Insulin									
No.	8	2	1	11		16	6		22
%	36.4	9.1	4.5	50		72.7	27.3		100
Combined									
No	10	6	2	9		21	6		27
%	37	22.2	7.4	33.3		77.8	22.2		100
Aspirin intake:									
No No.	41	13	8	29	0.59	76	15	0.59	91
%	45.1	14.3	8.8	31.9		83.5	15.5		100
Yes									
No.	6	1	0	2		8	1		9
%	66.7	11.1	0	22.2		88.9	11.1		100
Diabetes control									
Uncontrolled									
No.	30	10	8	22	0.2	57	13	0.2	70
%	42.9	14.3	11.4	31.4		81.4	18.6		100
Controlled									
No.	17	4	0	9		27	3		30
%	56.7	13.3	0	30		90	10		100
Associated hypertension									
No No.	26	4	4	20	0.1	44	10	0.4	54
%	48.1	7.4	7.4	37		81.5	18.5		100
Yes									
No.	21	10	4	11		40	6		46
%	45.7	21.7	8.7	23.9		87	13		100

* P value significance <0.05

R0= no retinopathy

R1= mild/moderated non-proliferative retinopathy

R2=severe non-proliferative retinopathy

R3= proliferative retinopathy

MO= no maculopathy

M1= maculopathy

Figure 2: A Sample of the result of fundus examination done to the study participants
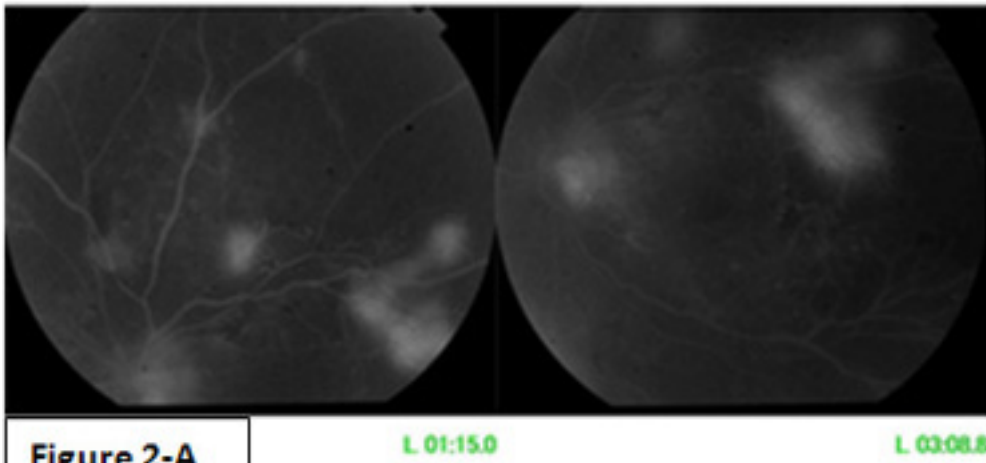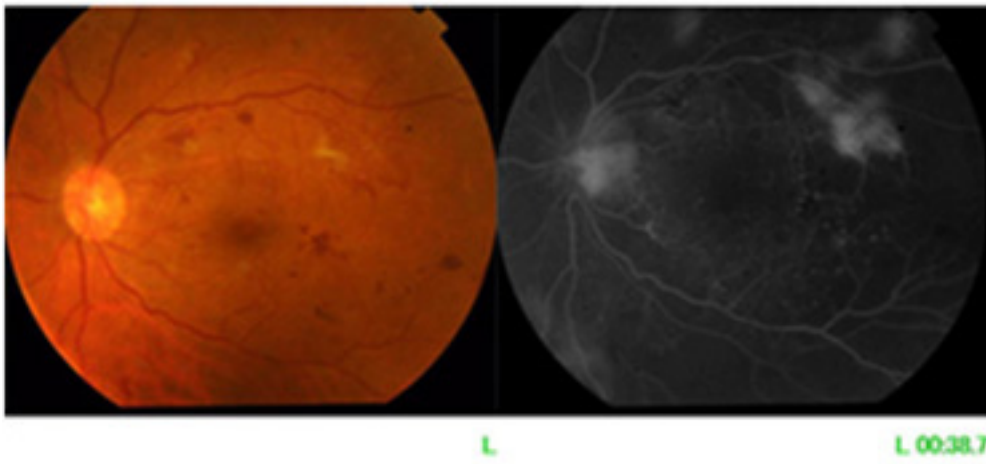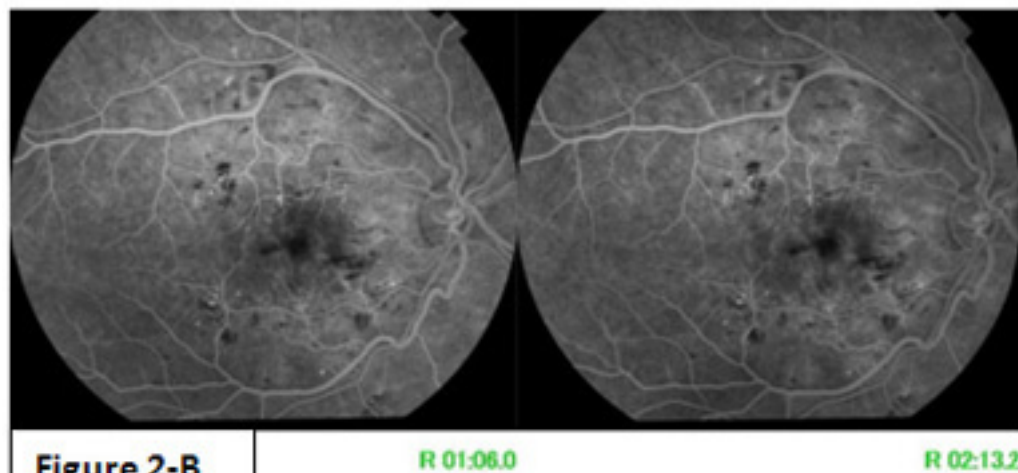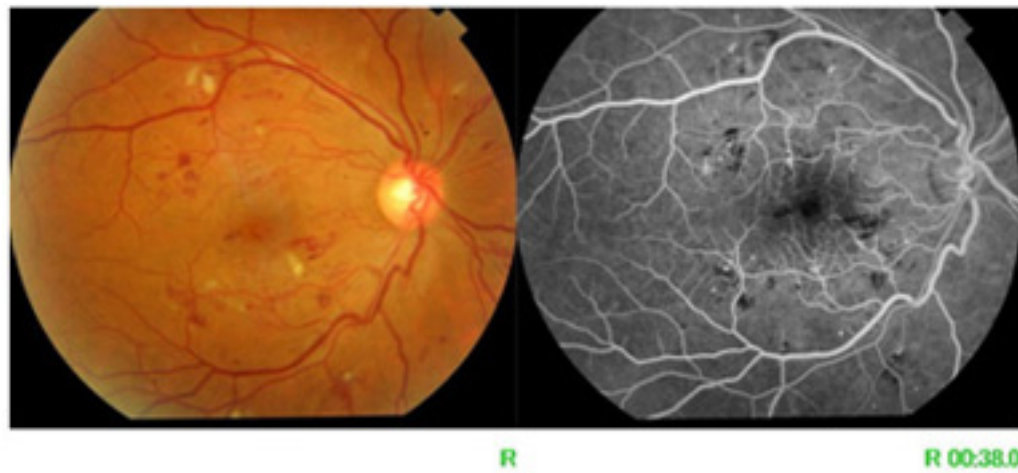

Figure 2-A

Figure 2-B

Table 5: Distribution of diabetic patients attending diabetic clinic regarding perceived glycemic control and its relation to objective glycemic control (2011)

Controlled (by test)		Controlled (Subjective) (total=100)					Total
		Not controlled (total=32)	Sometimes (total=24)	Controlled (total=41)	I don't know (total=3)	P value	
Not controlled	No.	30	17	21	2		70
	%	42.9	24.3	30	2.9	0.001	100
Controlled	No.	2	7	20	1		30
	%	6.7	23.3	66.7	3.3		100

Assessment of blood glucose level of the study participants revealed that only 30% of them were controlled. It was found that 66.7% of the participants who thought that they were controlled were actually controlled. And 42.9% of them who thought that they were not controlled were actually not controlled. And these relations were statistically significant (Table 5).

Discussion

DR is increasingly becoming a major cause of blindness throughout the world. In addition to loss of productivity, it has negative impact on the patient's quality of life leading to additional socioeconomic burden on the community. Lack of health education and dominance of wrong beliefs adversely affect the progression of diabetic eye complications among the Egyptian patients. Around half of the study participants had DR at the time of the examination; 22% had non-proliferative retinopathy and 31% had proliferative retinopathy. Only 16% of the participants had diabetic maculopathy. This percent is higher than other studies done in Malaysia (31.4%), Emirates (19%), and China (25%) (7,8,9). Therefore there is an urgent need to increase awareness and knowledge of Egyptian diabetic patients regarding diabetic eye complications as well as the importance of routine eye evaluations, so as to detect early ocular complications. In the current study, 79% of the patients were aware of diabetic complications on various body organs and 85% were aware of diabetic complications on the eye. However, 36% of the patients do not know the exact effect of diabetes on the eye, although they know that diabetes affect the eye, and only 33% of them knew that diabetes causes blindness or diminution of vision.

This percentage of awareness of diabetic eye complications was higher compared to other studies from Nepal (63.3%) and India (37%) (10, 11), and was closer to other studies from Malaysia (86.1%) and Nigeria (84.3%) (12, 13). On the other hand, the percentage of awareness of blindness as a complication of DR was lower compared to another study from Nigeria (80.5%) (13).

Providing health education to diabetic patients is crucial to increase the patients' compliance to the routine screening and to deal with the patient's faulty beliefs. In our study, only 25% of the patients were aware of the importance of screening of DR while 20% had a faulty belief that there is no need for regular screening if diabetes is well controlled. Also, most of the participants didn't know whether there is available treatment for DR or not (88%). This finding was worrisome especially when compared to the earlier study from India (11), in which over 90% of individuals were aware of the importance of screening of DR, approximately one-third were under the impression that control of blood sugar is enough to avoid visiting an ophthalmologist and around half of participants knew about the availability of laser treatment to treat DR.

In the current study, the main source of information was the physician (71%); 27.3% from the ophthalmologist, 21.6% from the family physician, 16% from the endocrinologist and 12% from the internal medicine specialist. The second source of awareness was from family members and friends (18%), especially that 65% of cases had a positive family history of diabetes. Mass media (such as magazines and radio) and reading played a less important role in disseminating information among our study participants (10%), This may be due to the fact that most of them were illiterate (70%). On comparing our results with that of Thapa et al (10), it was found that only half of the patients had received their information from physicians and family members were the second source of the patients' awareness. This finding emphasizes that health education provided by trained professionals and aggressive health campaigns promoted via the media regarding diabetic eye complications could help in dispersing information regarding this potentially blinding disease.

Lack of awareness leads to delay in seeking medical advice; this was evidenced by the low percentage of study participants who have done previous fundus examination (67%) especially during the 1st year of diagnosis of diabetes (10.4%). Also, the frequency of fundus examination is directly proportionate to HBA1c level and to the severity

of DR. This highly suggests that diabetic patients don't seek medical advice unless they suffer from severe visual impairment, which leads to the fact that they perform fundus examination for diagnosis rather than screening. This was also reported by Mohammed & Waziri in 2009 (13), where patients tend to wait until they suffer from visual complaints before screening.

In the present study, although the duration of diabetes was 10 ± 6.6 years, 33% of the patients had never had a fundus evaluation prior to this study. This result is slightly lower than in the study of Thapa et al, 2012 (10), in which half of the patients had never had fundus examination before the study. However, this result is higher than the study of Mohammed and Waziri, 2009 (13), where only 15.7% had ever had retinopathy screening. This emphasizes the crucial need of providing health education shortly after the diagnosis of diabetes especially in a community with low literacy as the case in our study. Health education sessions should highlight the important of screening and follow up visits.

In the current study, the main barrier to do fundus examination was being unaware of its importance (66%), in agreement with a study conducted in Malaysia (12) where the main barrier for diabetic eye screening was lack of understanding of diabetic eye disease.

In the present study, the patients' awareness at the age 30 to <40 years was the least, while the patients' awareness at the age 40 to <50 years was the highest, but this result is insignificant. Also, awareness of illiterate participants was the least and the awareness increased with the increase in the level of education, but this result was insignificant due to the small number of educated patients. On comparing these figures with that of Rani et al, 2008 (11), it was found that the awareness of the patients was higher at the age > 45 years and lower at the age from 35 to 45 years and it increased with the increase in the level of education. This supports the importance of providing health education regarding DR screening especially to illiterate patients.

In the current study, 51% of the patients were taking OHD for control of diabetes; 22% were on insulin and 27% were on combined insulin and OHD. The patients who were taking combined treatment for diabetes were more aware than other patients, and this result was statistically significant. This represents an indirect relationship as the patients on combined treatment for diabetes had higher exposure rate to medical health facilities which had a positive impact on their health literacy. In addition, awareness was higher among patients with positive family history of diabetes than patients with negative family history, and this result was statistically significant. This highly suggests that increasing the health awareness of all the family members of the patients is an important step to battle against DR.

In our study, it was found that DR is directly proportionate to duration of diabetes and inversely proportionate to age of onset of diabetes and these data were statistically significant. Also Herman et al, in 1994 (14) reported that

retinopathy was associated with the duration of diabetes and hyperglycemia. The same finding was also reported in another study conducted in Egypt (15). This highlights the necessity of creating awareness among diabetics of the importance of routine eye evaluations, so as to detect early ocular complications that may arise from diabetes mellitus.

Limitations of the study:
The findings of this study can't be generalized beyond the studied cases because the sample was collected from one clinic and the number of cases is too limited for broad generalizations.

Conclusion

Awareness creation is the corner-stone of any program aimed at reducing Diabetic Retinopathy. It was found that there was general awareness of diabetic retinopathy among the majority of the study participants; however there was little awareness of the importance of the screening. Around half of the participants had performed only one fundus examination after diagnosis of diabetes. The main barrier for performing the fundus examination was lack of awareness of its importance. Physicians should provide patient centered care to address the patient barriers, provide individual care for each patient and give health education to motivate patients and increase adherence to the screening examination.

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Estimation of some biophysical parameters in semen of fertile and infertile patients

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Abstract

Objective: The objective of this study is to estimate the magnitude of viscosity and density of seminal fluid in various male subjects, collected randomly in Erbil city, and to observe role of density in fertilization.

Materials and Methods: Rotating viscometer was used for assessment of viscosity of semen, while volume method was used to measure the density of semen. Density of semen and vice versa and how it changes with fertile and infertile persons in Erbil city was assessed. These investigations included kinematic, dynamic and relative viscosity of semen at room temperature (25) Centigrade.

Results: The results were based on a total of 56 samples of fresh semen collected from 44 infertile and 12 fertile patients in an industrial laboratory. The data in Table (1) displays that density and kinematic viscosity was not changed significantly between fertile and infertile patients at range $p < 0.05$.

Conclusion and Discussion: The project concluded by demonstration of the changes of viscosity of semen; where displayed it explained changes in relative viscosity and kinematic viscosity and their effects on the physiology of the human body, moreover to the disadvantage of increasing and decreasing of semen density with the locality of people.

Summary: This research proved the investigation of the viscosity and density of semen, how it was affected and its prevalence which depends on molecules adhesiveness and its association with fertility of patients in Erbil city.

Key words: measurement, viscosity, density, kinematic viscosity, physical properties of semen.

Introduction

Viscosity is the internal fractional force between molecules. The rheological properties of semen change dramatically after the material coagulates and this material then liquifies. Liquefaction occurs over a period of 5 minutes in vivo, but may take 20-30 minutes in vitro (1, 2).

The biochemical mechanism of this coagulation in liquefaction has been investigated by numerous researchers (3).

The coagulation factors derive from the seminal vesicles, while liquefying factor comes from the prostate (4).
The prevalence of semen hyperviscosity is estimated to be between (12-29%) and can lead to male factor infertility in both vivo and in vitro (5).

Anatomically the seminal fluid is secreted by male accessory glands i.e. seminal vesicle and prostate; any diseases in these organs change the fluid viscosity. These organs are sited near each other, displaying the short prevalence and weak stability of biophysical consistency of the fluid and any change in the semen environment by change of viscosity, will lead to disability of sperm and their motility (5 and 6) .

Basic semen analysis has remained an essential screening test in the assessment of human male fertility and measurement of semen volume is an important parameter (5). The sample graduated cylindrical method is used for measuring weight of coagulate such as semen analysis(6). It is a direct relationship between weight and volume which hinges on the density of the semen.

Only a few studies have examined the effects of electromagnetic fields on semen and reproduction in general. A study by Tateuo et al, 1998, exposed human semen to electromagnetic fields. Current frequency was applied and showed no increases in abnormalities of the structural semen when compared to the control (7).

The sperm electric charge gradually decreases with semen aging and with growing concentration of lactic acid. Diminished electrical charge will decrease sperm motility

and leads to formation of the agglutinations. Viscosity is an atypical characteristic of a real fluid. It arises from the shear stress between the layers of the fluid flow (8).

It has been seen that biochemical, enzymatic or genetic factors are possible causes of hyperviscosity of seminal fluid (9).

The issue of the electrical conductivity and dynamic viscosity has been rarely studied (10, 11).
The possible use of semen physical properties as an additional measure in semen evaluation in stallions has been considered.

This can be applied on quantitative and qualitative biophysical parameters in semen of fertile and infertile humans in Erbil city.

Abnormal coagulation, liquefaction, volume, viscosity and PH strongly suggests gland dysfunction (12).

Materials and Methods

This experiment employed (44) infertile and (12) fertile healthy males in Erbil city, through taking their sperm in an industrial laboratory and determining their dynamic viscosity by rotating viscometer and estimating density of semen by volume method. A viscometer is an instrument used to measure the viscosity of fluids.

For liquids with viscosities, which vary with flow conditions; an instrument called a Rheometer is used. Viscometers are only used to measure under flow condition.

Results

The results are based on a total of 56 samples of fresh semen collected from 44 infertile and 12 fertile patients in an industrial laboratory. The data in Table (1) display that; density and kinematic viscosity are not changed significantly between fertile and infertile patients at range $p < 0.05$.

In Table (1) the results show that there are significant differences in the viscosity and relative viscosity between fertile and infertile patients.

Table 1: Biophysical parameters of fertile and infertile seminal fluids

Biophysical parameters	Infertile=44 Mean±SD	Fertile=12 Mean±SD	Sign.
Viscosity/Cp	4.85±0.58	4.45±0.23	S
Density/Kg/m3	1.05±0.03	1.04±0.01	NS
Kinematic Viscosity/ cp.m3/kg	4.50±0.57	4.25±0.20	NS
Relative Viscosity	4.83±0.58	4.45±0.23	S

Discussion

The results of this study (in Table 1) by using T-Test shows that , when comparing viscosity between fertile and infertile patients there are significant differences in increases in the viscosity of semen between them. This result agrees with other researchers (13,14,15).

In Table 1 density and kinematic viscosity is not significantly changed between fertile and infertile patients. This investigation disagrees with authors (16,17).

The data in Table1 shows the relative viscosity decreases significantly between fertile and infertile patients at range p< 0.05. This finding agrees with authors (18,19).

This study found that increase in density indicated increase in viscosity of semen. This increases the probability that patients will be infertile (and vice versa).

Recommendation

Since not much research has been done in the field of biophysical properties of semen, the comparison of our results with others was somewhat restricted. Our experiment offered an insight into the issue of a possible assessment of semen qualitative and quantitative characteristics, based on the determination of semen biophysical properties. However, the results of this study need to be repeated and that is recommended before any serious implications can be drawn and needs to be reconfirmed so that this alternative examination can be made.

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Stories from the region

In our ongoing tribute to regional doctors and medical students going about their education, careers and lives under extremely difficult circumstances and often with lack of personal safety, we salute the second female medical graduate in the Dizaye family in Erbil Iraq - Saya Dizaye, pictured with her father Professor Kawa Dizaye, in the same place, at the same university he graduated from, Hawler University, 19 years apart.

We earlier featured older sister Sanaa and her father taken at her graduation in 2014, in the same place, 15 years apart.

Health Promotion, Disease Prevention and Periodic Health Checks: Perceptions and Practice among Family Physicians in Eastern Mediterranean Region

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Abstract

Introduction: The aim of this study was to identify the current practices and perceptions of family physicians regarding health promotion, disease prevention including periodic screening and health checks in Eastern Mediterranean Region.

Methods: A multi-country cross-sectional study was conducted in six countries of EMR, from September 2014 to March 2015. Family Physicians who were currently practicing in different countries of EMR were invited to participate in the study through email. A pre-tested structured questionnaire was used for data collection. Data was entered and analyzed on SPSS 19 and logistic regression analysis was performed.

Results: A total of 100 physicians' data was included in the final analysis. The majority were female physicians (76%): 63% were 25 to 35 years of age. Approximately 53% of Family physicians always recommend periodic screening and health checks to their patients. The common screening question asked to patients in medical history was related to their blood pressure (86%). Almost all (99%) of the Family physicians believe they should conduct periodic health checks. Those who had postgraduate training in Family Medicine (OR: 0.5; 95% CI: 0.39-1.67) and attended CME sessions regularly (OR: 0.11; 95% CI: 0.01-0.93), are more likely to recommend periodic screening and health checks to their patients.

Conclusion: Periodic screening and health check is an important strategy to prevent disease and maintain health. It is an underutilized practice and a great need exists for its implementation in family practice.

Key words: Periodic Screening, Health Screening, Health Check; Physical Examination; Health Assessment; Family Physicians

Introduction

Healthcare around the world is becoming sophisticated and expensive when it comes to its provision to the entire population. Availability of treatment options due to technological advances on one hand, and a rapidly increasing elderly population with multiple co-morbidities on the other is putting immense pressure on limited resources for healthcare provision.(1) Such valuable resources should be used efficiently. Thus, a strong focus on early disease detection through evidence-based and effective screening programs and regular health checks to specific age groups will help reduce disease burden and offer health service coverage to a larger segment of population to achieve universal health coverage.(2)

Periodic health screening and checks have assumed a very important position in primary care and family medicine, for their value for money in disease prevention, health maintenance and early detection of diseases. These examinations offer an effective strategy to detect diseases early and offer cost-effective intervention options and with good outcomes.(3)

Evidence-based screening strategies and tests are designed to pick up diseases early.(4) There is criticism of periodic screening and health checks that they have not shown outcome-based benefit.(5) It has been found much more useful when selected populations at higher risk for a medical condition are subjected to effective screening programs.(6) Despite all the criticism, evidence exists for early detection of diseases through periodic screening and health checks.(7)

There is substantial acceptance for periodic screening and health check and screening among patients, but costs for these measures and tests are a cause for decreased interest for such preventive health interventions.(8) Benefits of periodic screening and health checks have been demonstrated, yet more research is needed.(9,10) It is most challenging for a Family Physician to decide which patient to screen and to select the most appropriate screening method. Patients are presenting for periodic screening and health checks often have a hidden agenda such as a fear of underlying malignancy for example and this aspect much be kept in mind.(11)Eastern Mediterranean countries are faced with huge disease burden and a focus on health promotion, and disease prevention is essential to reduce such burden. We identified a need to look at the practices and perceptions of Family Physicians from the Region with regards to health promotion, disease prevention including periodic screening and health checks.

Methods

Study Setting
A multi country cross-sectional study was conducted across six countries (Bahrain, Egypt, Iraq, Kuwait, Pakistan and Saudi Arabia) of the 22 countries of the Eastern Mediterranean Region (EMR), from September 2014 to March 2015. These countries were selected to obtain perceptions and practice of Family Physicians regarding health promotion, disease prevention including periodic screening and health checks.

Selection of participants

Family Physicians who were currently practicing in these six countries of EMR were invited to participate in the study. They were informed about the study protocol and were requested to participate in the study and return the filled questionnaire through email within a month. Reminders were sent every week to the Family Physicians who agreed to participate in the study.

Informed Consent

The information about the study protocol and consent forms were sent to each Family Physician who agreed to participate in the study, and they were asked to return the signed consent form. The study was conducted in accordance with the Helsinki Declaration and the Departmental Research Committee of the Aga Khan University reviewed and approved the study.

Study Questionnaire

A questionnaire was formulated after compiling important aspects of periodic health evaluation through extensive literature search and by taking expert suggestions. The questionnaire was initially prepared in English; however, it was also translated to Arabic, as it is a common language in the region. The questionnaire was pre-tested on five physicians and ambiguities found were removed. The questionnaire was composed of 2 sections: The first section covers demographic details of the participants, while the second section focuses on perceptions and practices of physicians regarding health promotion, disease prevention including periodic screening and health checks.

Statistical Analysis

Data was entered and analyzed in SPSS version 19.0. The analysis was completed in two stages i.e. descriptive and inferential. Frequencies of all the variables were reported in the descriptive analysis. In the 2nd stage, logistic regression analysis was performed to identify the factors that promote Family physicians to recommend periodic health evaluation to their patients. In the regression analysis the outcome was Family physicians who recommend health evaluation to their patients (Yes/No). Univariate analysis was carried out to obtain the independent effects of factors on the outcome. Since none of the variables were found to be significant at the Univariate level, therefore, multivariate regression was not performed. The results were reported in the form of unadjusted odds ratio along with their 95% confidence interval. Throughout the analysis a P value of < 0.05 was considered statistically significant.

Results

Table 1: Baseline characteristics of Study Participants (n=100) (Part A)

Variables	Number
Age	
25-35	63
36-45	17
46-55	16
> 56 years	4
Gender	
Male	24
Female	76
Postgraduate Training	
Yes	87
No	13
Postgraduate Qualification (n=87)*	
Diploma	19
Master's Degree	7
Board/Membership Exam	63
PHD	2
Specialization (n=87)	
Family Medicine	93
Others	7
Where	
In East Mediterranean Region	95
Outside East Mediterranean Region	5
Avg. Patients per week	
< 25	57
25-50	41
100-200	2
Avg. time spent on patient	
5 min	17
10 min	47
15 min	24
20 min	12
Attend CME regularly	
Yes	92
No	8
No of CME hours per year	
10	23
20-40	18
20-50	31
> 50	20

Table 1 (Part B)

Current Post	
Private practice	8
Public practice	32
University post	19
Residency	41
Country	
Bahrain	1
Egypt	30
Iraq	30
Kuwait	1
Saudi Arabia	7
Pakistan	31

*Sum cannot be 100 as some FPs had more than 1 degree

The demographic characteristics of the participating physicians are presented in Table 1. A total of 100 Physicians returned completed questionnaires and were included in the final analysis. The response rate was 71% (100/140). The majority of the sample population were female physicians (76%) and 63% of them were between 25 to 35 years of age. About 87% of the physicians had a postgraduate training; 93% had done specialization in Family Medicine. Slightly over two-fifths (41%) were in their residency programs and 32% working in the public sector. On an average 57% see less than 25 patients per session and 47% spend at least 10 minutes with each patient during consultation. A vast majority of participants attended CME regularly; with 31% attending 20 to 50 CME credit hours per year. Of the total physicians sample, the majority were from Pakistan (31%), followed by Egypt (30%) and Iraq (30%).

Table 2: Family Physician questions asked in history and Physical examination

Questions	Always	Sometimes	Never
Do you recommend Periodic Health Check to your patients?	53%	47%	—
Do your patients request Periodic Health Check?	8%	86%	8%
Screening Questions			
Tobacco use	77%	19%	4%
Exercise	46%	42%	12%
Dietary pattern	49%	49%	2%
Family history of Diabetes	85%	14%	1%
Depression/Mental health disease	27%	54%	19%
Alcohol	25%	45%	30%
Habit forming drugs	28%	54%	18%
Body Mass Index (BMI)	38%	42%	20%
Blood pressure	86%	12%	2%
General and systemic examination to screen for abnormalities	62%	37%	1%

There are limited national screening programs in the surveyed countries which reflected poor quality of health service planning in these countries. Approximately 53% of the Family Physicians (FPs) responded that they always recommend periodic screening health checks to their patients. The clinical practice screening questions asked in history and in physical examination are given in Table 2. The FPs common health checks questions asked from patients in medical history were related to their blood pressure (86%), closely followed by family history of diabetes (85%) and tobacco use (77%). However, the least common questions asked from patients were about alcohol (25%), mental health status of patients (27%) and Body Mass Index (38%).

Table 3: Investigations & Health Education as part of Periodic Check Up

| Investigations	Always	Sometimes	Never
Hemoglobin	67%	33%	___
Stool for Occult blood	9%	63%	28%
Urine dipstick	27%	56%	17%
Blood sugar	60%	40%	___
HbA1C	13%	59%	28%
Lipid profile	50%	45%	5%
Thyroid function test	16%	68%	16%
Serum Creatinine and electrolytes	25%	59%	16%
Liver function tests:	24%	63%	13%
Serum Vitamin D3	7%	41%	52%
Bone Density	11%	49%	40%
Electrocardiogram	22%	70%	8%
Chest X-Ray	19%	69%	12%
Mammogram	10%	51%	39%
Cervical smear	8%	41%	51%
Prostate specific antigen	8%	19%	73%
Adult Vaccine Status	19%	69%	12%
Travel Vaccine Status	20%	26%	54%
Health Education			
Obesity	81%	19%	___
Smoking	82%	18%	___
Diet	81%	19%	___
Exercise	74%	26%	___

Clinical practice investigations as part of periodic physical examination are presented in Table 3. Over two thirds (67%) of the FPs responded that they always use hemoglobin as clinical marker in health evaluations. About 60% always order blood sugar and 50% request for lipid profile. 51% of them mentioned that they never advised patients for cervical smear, 73% of them never asked patients to get prostate specific antigen, and about 54% didn't ask about the travel vaccine status. The majority of them provide counseling to patients during periodic health checks on obesity and diet (81%), smoking (82%) and exercise (74%).

Almost all (99%) FPs were of the view that periodic heath evaluations should be conducted by them while 43% believed that they should be conducted by nurses. Besides that, 98% of them responded that the evaluation should be conducted in primary health center clinics. As far as frequency of periodic health evaluations is concerned, 73% of them would recommend health evaluations every year, whereas, 17% recommend it every two years and 10% every three years. 62% of the Family physicians agree that ongoing opportunistic check is as important as periodic health evaluations. About one third of them believed that preventive health practices do not interfere with ongoing disease treatment and care (Table 4).

Table 4: Perceptions of Family Physicians regarding Periodic Health Check Up (n=100)

Variables	Yes	No	Don't Know
Periodic Health Evaluations Should be carried out by			
Nurse Practitioner	43%	50%	7%
Family Physician	99%	1%	____
Internist	45%	39%	16%
Where Health evaluation be carried out			
Patient's home	20%	77%	3%
Primary Health Care facility	98%	2%	____
Hospital	46%	49%	5%
Do you agree that ongoing opportunistic screening is as important as periodic physical evaluation/check?	62%	29%	9%
Preventive health practice interferes with provision of ongoing curative care:	29%	33%	38%

Figure 1: Factors that promote Family Physicians Periodic Health Evaluations Practice
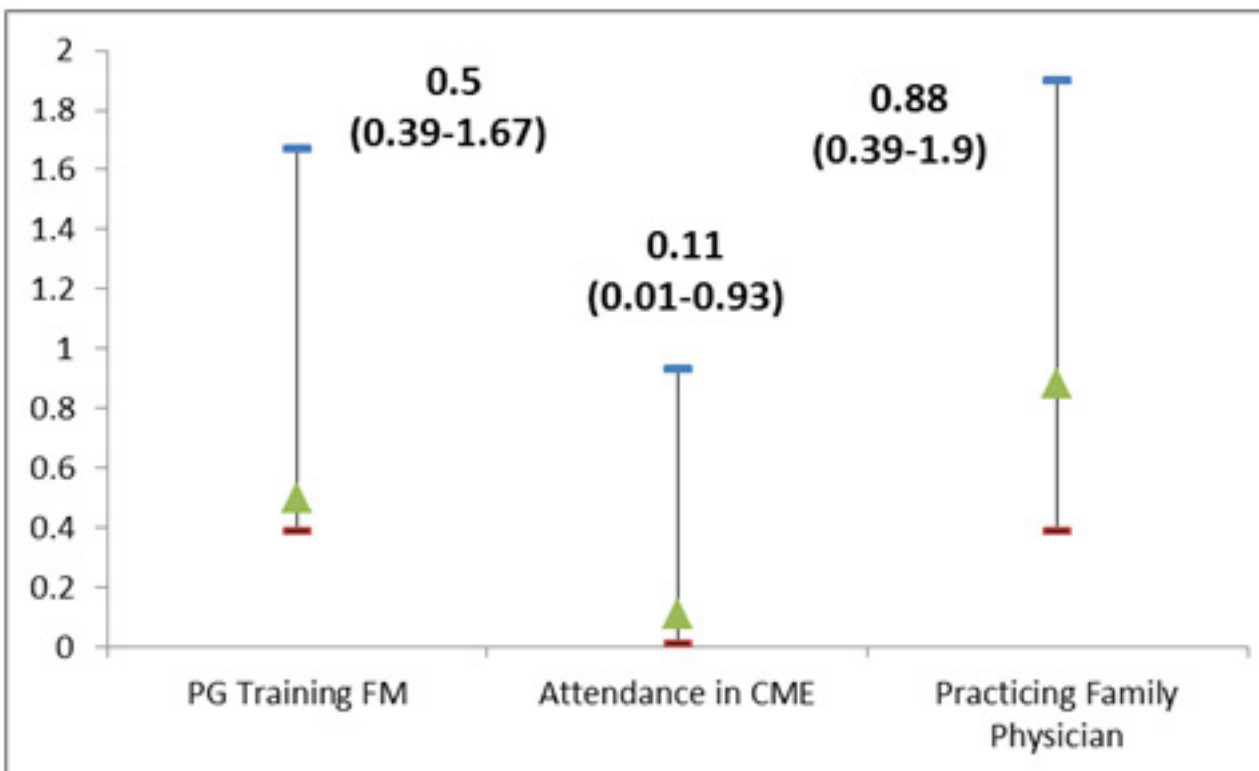
Univariate logistic regression analysis
*Attendance in CME significant at p value < 0.05

Figure 1 depicts the factors that motivate FPs to recommend periodic screening health checks to their patients. Those who had a postgraduate training in Family Medicine (OR: 0.5; 95% CI: 0.39-1.67) are more likely to recommend health evaluations to their patients. Likewise, those who attend CME sessions regularly (OR: 0.11; 95% CI: 0.01-0.93) and those who are working as trained Family physicians (OR: 0.88; 95% CI: 0.39-1.9) are promoters of periodic screening health checks.

Discussion

This is probably among the first studies from the East Mediterranean region that looks at health promotion, disease prevention including periodic screening health checks and the perception and practice of Family Physicians in the Region. The sample was limited to 100 respondents; the majority of them were women, in residency training or with postgraduate qualifications and undertaking Continuing Medication Education on a regular basis. Therefore, it will not be possible to generalize results of this study to Family Physicians practicing in EMR. Even with this limitation, results of our study do offer insight into the knowledge, attitude and practices of Family Physicians with regards to health promotion, disease prevention including periodic screening health checks in the region. Half of respondents in this study recommend periodic screening and health checks to their patients. Yet it is disappointing to note a much smaller number of patients request these important health services from their doctors. In Eastern Mediterranean Countries, an earlier study showed that 90% of the Physicians recommend periodic health evaluation to patients.(12)

It has been noted that patient's preference for preventive strategies depends on household income and education.(13) It is again encouraging to note that a significant number of respondents ask about smoking, exercise and diet in the history and check for blood pressure, yet a much smaller number actually look at body weight and BMI.

It is also encouraging to note that a substantial number of respondents recommend blood sugar, lipid profile, hemoglobin, serum creatinine and LFTs for their patients during these health checks encounters. A need exists to focus on adult and travel vaccination for disease prevention. A recent study has shown that adult immunization coverage is less than satisfactory, even in those who have insurance coverage.(14) It is again encouraging to note respondent's recommendation for lifestyle related patient education and counseling.

The recommendation by most respondents that such periodic screening and health checks should be provided in primary care settings is more than welcomed, even though a substantial number of them feel that it interferes with provision of ongoing disease treatment and care. It has been earlier reported that need for acute and chronic disease treatment and care interferes with the provision of promotive and preventive health interventions.(15) It is no surprise that respondents with postgraduate training in Family Medicine and those undertaking CME activities recommended periodic screening and health checks more often to their patients.

The study indirectly highlighted the shortcoming in the health systems of EMR countries; the lack of national systematic approaches to periodic screening and health checks to target population based on best evidence. Promotion and prevention interventions at community (routine) and individuals (opportunistic) can be achieved for the benefits of the people without universal health coverage through comprehensive primary care services for all.(2)

Research is required to demonstrate long-term benefits of delivering several preventive interventions during preventive health examinations. It is also required to assess such interventions in the context of different populations needs, defining comparisons to "routine care" and carefully evaluate intermediate outcomes, harms and costs.(16)

Conclusion

Health services are becoming complex and expensive. With the availability of new intervention modalities and an increasing ageing population, it is becoming challenging to provide adequate health service coverage. Given this background, health promotion, disease prevention including periodic health examinations will reduce healthcare costs and provide funds to promote access to healthcare to the majority of those who need it and with equity. We have found support for health promotion, disease prevention including periodic screening and health checks in this study and recommend its practice in Eastern Mediterranean region.

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Virology vigilance - an update on MERS and viral mutation and epidemiology for family doctors

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Abstract

This paper reviews aspects of virus mutation and spread generally as well as providing a review of the major viruses affecting people in the MENA and MESA regions.

Key words: virus, mutation, Middle East Respiratory Syndrome (MERS), Severe acute respiratory syndrome (SARS), Human Immunodeficiency Virus (HIV), rotavirus, Chikungunya, Ebola, avian flu, Marburg virus, rabies, dengue

Introduction

Viruses have been with mankind and the animal kingdom since recorded history and their aetiology is still not fully known.

Viruses are not cellular organisms and they may have either developed separately, or have been a precursor to cellular life; probably they are developing 'genetically' according to their own innate structure.

Throughout history the influenza viruses particularly, (having connections to simian life), have been the greatest everyday concern to man and Dengue viruses also take large numbers of lives in endemic areas.

Some viruses like smallpox, now eradicated, had been around for as long as recorded history - along with childhood viral complaints like rotavirus. Some scientists believe the Black Death (Bubonic plague) may have been an Ebola type virus.

While there are viruses specific to humans and particular animal species, the problematic viruses have become those that have spread from animals to humans due to mutation. Some of these mutations have then gone on to human to human transmission.

Even given better global communications has there been an actual increase in virus mutation and spread? In this past 100 years dramatic new viruses such as HIV, and Ebola, have emerged and spread rapidly among humans and have caused global concern; new strains of corona viruses such as SARS and MERS have been shown to spread rapidly and dramatically into new populations. We are yet to quantify if viruses spreading into new host populations may have an advantage and therefore greater impact on human health in geographical areas other than those in which the viruses originated.

The question for scientists and doctors to answer is, are these outbreaks just part of normal historical viral epidemiology or do they represent an advanced state of viral infection due to the virus's own increased virility or due to, for example, changes in our biosphere and the ecosphere of carriers (animals and birds) providing the virus better access into human hosts. Does human over- population of the planet, and human's greater proximity to concentrated animal populations (intensive animal husbandry) provide a new opportunity for both development of mutant strains and or the spread of such mutations globally into human populations in greater numbers?

If yes, we need to look generally at development and spread patterns in animal and human hosts of existing viruses and look equally at the possibility of development of new strains in certain environments.

It remains an ongoing problem and ongoing work for doctors, technicians and public health personnel, as well as global health organisations. Family doctors who are usually the first contacted and who live in the patient's local environment where the outbreak may have originated, particularly need to be alert not just for evidence and symptoms of existing strains but for pockets of new viral strains/mutations.

No part of the world is immune to either locally developed viral outbreaks or strains of viruses brought by travellers, or migrant workers into the local population.

Ideally and with proper scientific application we should be able to start to pinpoint risk factors/areas of risk of development of outbreaks (agricultural areas, specific climatic conditions, migration paths of wild animal and bird species) and put in strategies on the community level to contain, or better, prevent, outbreaks.

In this paper we also provide an update on MERS and other globally circulating viruses for regional family doctors who may have patients travelling to the Hajj, going on Ramadan holidays, and for those who will see patients who have travelled from endemic areas overseas.

Virus mutation

Accurate estimates of virus mutation rates are important to understand the evolution of the viruses and to combat them. However, methods of estimation are varied and often complex.

The mutation rate is a critical parameter for understanding viral evolution and has important practical implications. For example, the estimate of the mutation rate of HIV-1 demonstrated that any single mutation conferring drug resistance should occur within a single day and that simultaneous treatment with multiple drugs was therefore necessary. (1)

The viral mutation rate also plays a role in the assessment of possible vaccination strategies and it has been shown to influence the stability of live attenuated polio vaccines. At both the epidemiological and evolutionary levels, the mutation rate is one of the factors that can determine the risk of emergent infectious disease, i.e., pathogens crossing the species barrier.

Slight changes of the mutation rate can also determine whether or not some virus infections are cleared by the host immune system and can produce dramatic differences in viral fitness and virulence, clearly stressing the need to have accurate estimates. (1)

Future mutation rate studies should fulfil the following criteria:

- the number of cell infection cycles should be as low as possible,
- the mutational target should be large,
- mutations should be neutral or lethal or a correction should be made for selection bias.

Adhering to these criteria will help us to obtain a clearer picture of virus mutation patterns. (1)

There have been many laboratory-based investigations since the emergence of the new coronaviruses in 2012, but most of the parameters required for establishing scientifically the control measures that will protect against them have yet to be determined. Equally, the global distribution of the viruses in their animal reservoir has yet to be established. The approach to monitoring of virus mutation is to highlight particular questions that need to be answered for the purposes of preventing or treating these infections and diseases.

Tables 1-3, on the following page, provide a summary of data and investigations required for control or mitigation of virus spread.

Table 1: Information required from investigations for control or mitigation of a novel respiratory virus affecting humans

Reservoir of infections: animal, human, environmental
Modes of transmission to humans and effective prevention of transmission
Survival of the viruses in infectiousness doses in the environment
Method of spread: human-to-human
Setting when infections take place and procedures associated with transmission
Those at risk of infection: risk factors for transmission
Those most likely to transmit
Those at highest risk of severe disease
Population susceptibility
Incubation period
When cases are infectious and how this relates to symptoms
Reproductive number and serial interval
Clinical presentation and clinical spectrum
Antiviral susceptibility if any
Effectiveness of specific treatment and care strategies
Proportionate and effective infection control procedures

Table 2: What parameters are involved in virus spread?

Modes of transmission
Method of spread
Those at risk of infection
Setting when infections take place
Incubation period
When infectious
Reproductive number
Clinical presentation
Effective control measures
Those at highest risk of severe disease

Table 3: Specific public health questions regarding novel corona viruses that need to be answered

What do we need to know?
1. Where geographically are the human infections occurring worldwide?
2. What is the reservoir of the virus infection?
3. The estimated incubation period (from exposure to symptoms) and serial interval?
4. How infectious are these cases and what are the sources of infectious virus?
5. When are these cases infectious to others?
6. Are there any super-spreading events?
7. What do cases look like?
8. Who are the high risk groups?
9. How best to manage and treat the patients

Dealing with virus outbreaks

Viruses cannot exist on their own and for survival they need to spread to another host. This is because the original host may either die or eliminate the infection. Some important routes of viral transfer include:

Route	Examples
Skin contact	HPV (warts)
Respiratory	SARS, Cold viruses, influenza, measles, mumps, rubella
Faecal-oral	Polio, Coxsackie, Hepatitis A, Rotavirus
Milk	HIV, HTLV-1, CMV
Trans-placental	Rubella, CMV, HIV
Sexually	Herpes 1 and 2, HIV, HPV, Hepatitis B
Insect vector	Yellow fever, Dengue fever
Animal bite	Rabies

Global and regional virus updates

MERS

Middle East respiratory syndrome coronavirus (MERS-CoV) maps and epicurves

Global update
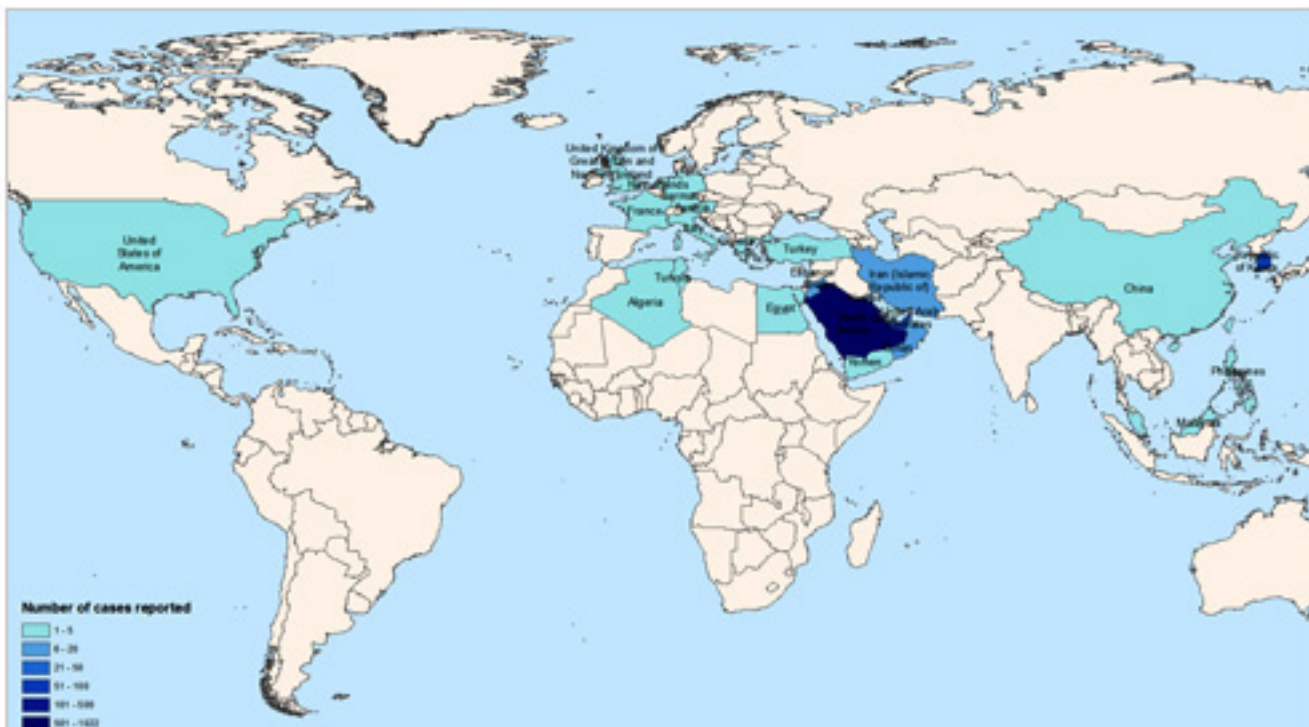
Number of regional and global cases reported: Reproduced with permission from World Health Organization

Corona viruses are a large and diverse family of viruses that include viruses that are known to cause illness in humans. Middle East Respiratory Syndrome coronavirus (MERS-CoV) has never previously been detected in humans or animals but appears most closely related to coronaviruses previously found in bats. It is genetically distinct from the SARS coronavirus, and appears to behave differently.

The World Health Organization (WHO) first reported cases of Middle East Respiratory syndrome (MERS) coronavirus on 23 September 2012.

While Saudi Arabia has still recorded the highest number of MERS deaths, (over 400) the outbreak continues in South Korea with 33 deaths and 183 cases to mid June 2015.

All cases have lived in or travelled to the Middle East, or have had close contact with people who acquired the infection in the Middle East.

MERS Symptoms
• Most people become unwell quickly, with fever, cough, shortness of breath, leading to pneumonia.
• Other symptoms include muscle pain, diarrhoea, vomiting and nausea.
• There have also been people with mild symptoms or no symptoms at all. These people had close contact with others who were seriously ill.

How MERS spreads
• It appears to spread from an infected person to another person in close contact. The virus does not appear to spread easily from person-to-person and appears to spread only from people who are sick.
• Some people in the Middle East appear to have caught the disease from infected camels and bats. How this occurred is not well understood.

People with underlying illnesses that make them more vulnerable to respiratory disease may be at a higher risk.

How it is diagnosed
A laboratory test on fluid collected from the back of the throat or the lungs can diagnose MERS-CoV.

How it is treated
There is no vaccine for MERS-CoV but early and careful medical care can save lives.

Key facts
• Middle East respiratory syndrome (MERS) is a viral respiratory disease caused by a novel coronavirus (MERS-CoV) that was first identified in Saudi Arabia in 2012.
• Coronaviruses are a large family of viruses that can cause diseases ranging from the common cold to Severe Acute Respiratory Syndrome (SARS).
• Typical MERS symptoms include fever, cough and shortness of breath. Pneumonia is common, but not always present. Gastrointestinal symptoms, including diarrhoea, have also been reported.
• Approximately 36% of reported patients with MERS have died.
• Although the majority of human cases of MERS have been attributed to human-to-human infections, camels are likely to be a major reservoir host for MERS-CoV and an animal source of MERS infection in humans. However, the exact role of camels in transmission of the virus and the exact route(s) of transmission are unknown.
• The virus does not seem to pass easily from person to person unless there is close contact, such as occurs when providing unprotected care to a patient.

Between 1 and 4 June 2015, the National IHR Focal Point for the Kingdom of Saudi Arabia notified WHO of 5 additional cases of Middle East respiratory syndrome coronavirus (MERS-CoV) infection, including 1 death.

Contact tracing of household and healthcare contacts is ongoing for these cases.

In patients with suspected pneumonia or pneumonitis with a history of recent residence or travel (in the 14 days prior to symptom onset) in the Middle East*, or close contact with confirmed or probable cases, the following is recommended:

1. The patient should be placed in a single room if available and standard and transmission-based precautions implemented (contact, droplet and airborne), including the use of personal protective equipment (PPE).
2. The relevant state/territory public health unit/communicable diseases branch must be notified urgently of any suspected (and probable or confirmed) cases in order to discuss patient referral and coordinate management of contacts.

Note: Transiting through an international airport (<24hours duration, remaining within the airport) in the Middle East is not considered to be risk factor for infection.

Are GPs/FPs at risk from MERS-CoV?
Many confirmed cases have occurred in healthcare-associated clusters, and there have been a large number of cases in healthcare workers, but mainly in hospital settings as has predominantly, if not exclusively, been the case in South Korea.

The particular conditions or procedures that lead to transmission in hospital are not well known. However, lapses in infection control were known to have occurred for seven healthcare workers who acquired the infection from cases in Saudi Arabia.

Patient Pre-travel advice, travel restrictions, periods of peak travel
The WHO does not currently recommend any restrictions to travel due to the MERS-CoV outbreak.

Travellers should be aware of the importance of personal hygiene including frequent hand washing, avoiding close contact with animals and with people who are suffering from acute respiratory infection, and should be advised to seek medical attention as soon as possible if they feel unwell. They should also follow usual food hygiene practices for travellers, including avoiding drinking raw milk or eating food that may be contaminated with animal secretions or products unless they are properly washed, peeled or cooked.

What are the recommended isolation and PPE recommendations for patients in hospital?
In summary, transmission-based precautions for suspected, probable and confirmed cases should include:

• Placement of confirmed and probable cases in a negative pressure room if available, or in a single room from which the air does not circulate to other areas

- Airborne transmission precautions, including routine use of a P2 respirator, disposable gown, gloves, and eye protection when entering a patient care area
- Contact precautions, including close attention to hand hygiene
- If transfer of the confirmed or probable case outside the negative pressure room is necessary, asking the patient to wear a surgical face mask while they are being transferred and to follow respiratory hygiene and cough etiquette.

Ebola

Ebola is spread through contact with blood or other body fluids, or tissue from infected people or animals. The known strains vary dramatically in their fatality rates. The Bundibugyo strain fatality rate is up to 50 percent, and it is up to 71 percent for the Sudan strain, according to WHO.

Less than two months after Liberia was declared Ebola-free by the World Health Organization, the virus is back in the country.

Even when the outbreak diminished in Liberia, neighboring Guinea and Sierra Leone have continued to see 20 to 27 cases a week since late May 2015, according to the WHO. There have been more than 11,000 total deaths from the outbreak since it began in March 2014.

Ebola Situation Report - 8 July 2015
There were 30 confirmed cases of Ebola virus disease (EVD) reported in the week to 5 July 2015: 18 in Guinea, 3 in Liberia, and 9 in Sierra Leone.

Ebola Situation Report - 1 July 2015
There were 20 confirmed cases of Ebola virus disease (EVD) reported in the week to 28 June, the same as the previous week. Weekly case incidence has been between 20 and 27 cases for 5 consecutive weeks. In Guinea, 12 cases were reported from 3 prefectures: Boke, Conakry, and Forecariah.

Chikungunya virus

While not fatal, this virus can have a chronic disabling effect and it has spread rapidly around the globe.

Chikungunya is ravaging the Caribbean, having affected 24 Caribbean nations and possibly more than 850,000 people worldwide, including 185 Americans (in New Jerseyans). Chikungunya virus is most often spread to people by Aedes aegypti and Aedes albopictus mosquitoes. These are the same mosquitoes that transmit dengue virus.

- The only way to prevent chikungunya is to prevent mosquito bites, such as by using repellant.
- Several vaccines are in the developmental stage but none are in the licensing stage.
- Generally, more South Jersey counties have a higher risk because they have more Asian Tiger Mosquitoes.

It is predicted that chikungunya virus will spread through rest of the globe this year (2015).

- Prior to 2013, chikungunya virus outbreaks had been identified in countries in Africa, Asia, Europe, and the Indian and Pacific Oceans.
- In late 2013, the first transmission of chikungunya virus in the Americas was identified in Caribbean countries and territories. Local transmission means that mosquitoes in the area have been infected with the virus and are spreading it to people.
- Since then, local transmission has been identified in 44 countries or territories throughout the Americas with more than 1.2 million suspected cases reported to the Pan American Health Organization from affected areas.

Symptoms
- Most people infected with chikungunya virus will develop some symptoms.
- Symptoms usually begin 3-7 days after being bitten by an infected mosquito.
- The most common symptoms are fever and joint pain.
- Other symptoms may include headache, muscle pain, joint swelling, or rash.
- Chikungunya disease does not often result in death, but the symptoms can be severe and disabling.
- Most patients feel better within a week. In some people, the joint pain may persist for months.
- People at risk for more severe disease include newborns infected around the time of birth, older adults (>65 years), and people with medical conditions such as high blood pressure, diabetes, or heart disease.
- Once a person has been infected, he or she is likely to be protected from future infections.

SARS

Severe acute respiratory syndrome. No outbreaks since May 2004 China

Avian Flu

Avian influenza A (H7N9) is a subtype of influenza viruses that have been detected in birds in the past. This particular A (H7N9) virus had not previously been seen in either animals or people until it was found in March 2013 in China.

However, since then, infections in both humans and birds have been observed. The disease is of concern because most patients have become severely ill. Most of the cases of human infection with this avian H7N9 virus have reported recent exposure to live poultry or potentially contaminated environments, especially markets where live birds have been sold. This virus does not appear to transmit easily from person to person, and sustained human-to-human transmission has not been reported.

WHO risk assessment of human infection with avian influenza A (H7N9) virus
On 23 February 2015 WHO conducted a risk assessment in accordance with the WHO recommendations for rapid

risk assessment of acute public health events the summary can be found below.

Risk assessment

This 23 February 2015 risk assessment was conducted in accordance with WHO's published recommendations for rapid risk assessment of acute public health events and will be updated as more information becomes available.

Overall, the public health risk from avian influenza A(H7N9) virus has not changed since the assessment published on 2 October 20142.

What is the likelihood that additional human cases of infection with avian influenza A (H7N9) viruses will occur?

The understanding of the epidemiology associated with this virus, including the main reservoirs of the virus and the extent of its geographic spread among animals, remains limited. However, it is likely that most human cases were exposed to the H7N9 virus through contact with infected poultry or contaminated environments, including markets (official or illegal) that sell live poultry. Changes to hygiene practices in live poultry markets have been implemented in many provinces and municipalities. Since the virus source has not been identified nor controlled, and the virus continues to be detected in animals and environments in China, further human cases are expected in affected and possibly neighbouring areas.

What is the risk of international spread of avian influenza A (H7N9) viruses by travellers?

On 27 and 31 Jan 2015, Canada reported 2 cases of human infection with avian influenza A (H7N9) in travellers returning from China. These travellers had mild symptoms and only reported indirect contact with poultry. On 12 February 2014, Malaysia reported one human case with avian influenza A (H7N9) virus infection. The patient was a Chinese resident who travelled to Malaysia while sick, and was most likely exposed in China. No further cases were reported in Malaysia linked to this case.

It is possible that further similar cases will be detected in other countries among travellers from affected areas, although community-level spread in these other countries is unlikely.

Flu viruses

During a typical flu season, up to 500,000 people worldwide will die from the illness, according to WHO. But occasionally, when a new flu strain emerges, a pandemic results with a faster spread of disease and, often, higher mortality rates.

There are four types of virus that cause seasonal flu in humans. Every year, drug developers try to predict which strains are likely to dominate in the next flu season so as to create an effective flu vaccine.

A good understanding of the rate and pattern of virus evolution helps these predictions, as one of the authors,

Dr. Ian Barr, of the World Health Organization (WHO) Collaborating Centre for Reference and Research on Influenza in Melbourne, Australia, explains:

"This work represents another piece in the complex puzzle of influenza virus circulation and human infections and provides insights that will help develop better influenza vaccines that match strains circulating in the community."

The four viruses that cause seasonal flu in humans are: influenza A viruses H3N2 and H1N1, and influenza B viruses Yamagata and Victoria.

The viruses cause similar symptoms - for instance sudden fever, tiredness and weakness, dry cough, headache, chills, muscle aches, sore throat - and they evolve in similar ways.

But what has not been well understood is their different patterns of spread around the world and what influences them.

H1N1 and B viruses persist locally between epidemics.

Marburg virus

Scientists identified Marburg virus in 1967, when small outbreaks occurred among lab workers in Germany who were exposed to infected monkeys imported from Uganda. Marburg virus is similar to Ebola in that both can cause hemorrhagic fever, meaning that infected people develop high fevers and bleeding throughout the body that can lead to shock, organ failure and death.

The mortality rate in the first outbreak was 25 percent, but it was more than 80 percent in the 1998-2000 outbreak in the Democratic Republic of Congo, as well as in the 2005 outbreak in Angola, according to the World Health Organization (WHO).

Rabies

Although rabies vaccines for pets, which were introduced in the 1920s, have helped make the disease exceedingly rare in the developed world, this condition remains a serious problem in India and parts of Africa.

It destroys the brain, but there is a vaccine against rabies, and we have antibodies that work against rabies, so if someone gets bitten by a rabid animal they can be treated,

If a patient doesn't get treatment, there's a 100 percent possibility they will die.

HIV

In the modern world, the deadliest virus of all may be HIV. It is still the biggest killer. An estimated 36 million people have died from HIV since the disease was first recognized in the early 1980s.

Powerful antiviral drugs have made it possible for people to live for years with HIV. But the disease continues to devastate many low- and middle-income countries, where 95 percent of new HIV infections occur. Nearly 1 in every 20 adults in Sub-Saharan Africa is HIV-positive, according to WHO.

Dengue

Dengue virus first appeared in the 1950s in the Philippines and Thailand, and has since spread throughout the tropical and subtropical regions of the globe. Up to 40 percent of the world's population now lives in areas where dengue is endemic, and the disease - with the mosquitoes that carry it - is likely to spread farther as the world warms.

Dengue sickens 50 to 100 million people a year, according to WHO. Although the mortality rate for dengue fever is lower than some other viruses, at 2.5 percent, the virus can cause an Ebola-like disease called dengue hemorrhagic fever, and that condition has a mortality rate of 20 percent if left untreated.

Rotavirus

Two vaccines are now available to protect children from rotavirus, the leading cause of severe diarrheal illness among babies and young children. The virus can spread rapidly, through what researchers call the fecal-oral route (meaning that small particles of feces end up being consumed).

Although children in the developed world rarely die from rotavirus infection, the disease is a killer in the developing world, where rehydration treatments are not widely available.

The WHO estimates that worldwide, 453,000 children younger than age 5 died from rotavirus infection in 2008. But countries that have introduced the vaccine have reported sharp declines in rotavirus hospitalizations and deaths.

The future

The severity of viral outbreaks will largely depend on the local, regional and global response to them. Early vigilance by public health authorities and family doctors in endemic areas, particularly, are the greatest preventive measure along with hygienic practices of people, especially those living in close proximity to animal or bird carriers and those in hospital situations.

Global measures will need to be enacted early and up to date information made available to limit spread when it does occur.

Ideally, as in the case of smallpox which was declared eradicated in 1980 following a global immunization campaign led by the World Health Organization, we can start to tackle both the initial outbreaks and the spread of the more life threatening viruses.

This takes money and global will.

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