

Awareness of Degenerative Cervical Myelopathy Among Medical Students in Aseer region, Saudi Arabia

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Abstract

Background: Cervical myelopathy is the most common cause of acquired spinal cord compromise. The concept of degenerative cervical myelopathy (DCM), defined as symptomatic myelopathy associated with degenerative arthropathic changes in the spine axis, is being introduced. Patients with DCM visit many doctors due to a variety of symptoms, mainly orthopedics, neurosurgeons, neurologists, or physiotherapists.

Aim: This study aims to assess awareness and perception of Degenerative Cervical Myelopathy among medical students in Aseer region, Saudi Arabia.

Methods: A descriptive cross-sectional survey was conducted in Aseer region, Southern Saudi Arabia targeting all medical students and interns at the College of Medicine. An online questionnaire was initiated by the study researchers after intensive literature review and expert's consultation. The final questionnaire was published using the social media platforms from 1st of September to 3rd of September, 2022. The questionnaire was uploaded online by the researchers and their friends, or relatives till no more new answers were obtained.

Results: A total of 380 medical students and interns completed the study survey. Students' ages ranged from 18 to 30 years with mean age of 22.6 ± 2.1 years old. Exactly 235 (61.8%) students were females and 212 (55.8%) were in their clinical study years. Exactly 106 (27.9%) students had good awareness level regarding DCM while 274 (72.1%) had poor awareness level. The most reported source of information was internet (46.3%), followed by lectures (33.9%), social media (30%), textbook (18.9%), and workshop (15.5%).

Conclusion: In conclusion, the current study showed that medical students' awareness regarding DCM was poor especially among male students and others who had not been taught about the disease. Also, the internet was the most prominent source of students' information rather than study lectures.

Keywords: Degenerative cervical myopathy, myopathy disorders, medical students, Awareness, Saudi Arabia.

Introduction

Degenerative cervical myelopathy (DCM) is the most frequent non-traumatic, progressive spinal cord dysfunction with an estimated incidence of 2% (1). DCM features include neck and radicular pain, fine motor dysfunction, gait instability, and bladder dysfunction and unclear common diagnostic criteria (2). Among neglected cases, DCM may result in partial cervical spinal cord injury (SCI). This clinicopathological disorder is due to acquired stenosis of the cervical spinal canal where superimposed congenital stenosis secondary to osteoarthritic degeneration may or may not be associated or ligamentous aberrations of the spinal column. This disorder can be attributed to osteoarthritis of the knee or hip. DCM can lead to progressive disability and paralysis due to chronic spinal cord compression and non-traumatic spinal cord injury (3, 4).

Patients with DCM visit many doctors due to a variety of symptoms and these are mainly orthopedics, neurosurgeons, neurologists, and physiotherapists (5). Surgical decompression of the encroached spinal cord is suggested among cases with moderate/severe, or progressive symptoms. Treatment goals of enabling earlier and/or preventative treatment have now been defined as a priority research need (6).

In its early stages, DCM is usually underdiagnosed or misdiagnosed as carpal tunnel syndrome or peripheral neuropathy, till patients have serious weakening of upper and lower limb function which influences the consideration of incomplete cervical SCI. Given that DCM is a progressive but preventable neurological condition, the delayed diagnosis and late referral for evaluation of surgical decompression, can lead to poorer neurological outcomes (7).

In Saudi Arabia, a study was conducted to find out the pattern of degenerative cervical spine disease at King Abdulaziz university hospital. The most common degenerative cervical spine changes were found at C 5-6 levels. The younger patients tended to have higher cervical spine level involvement. The mean duration of symptoms was 41 months. The younger patients tended to present more with weakness and numbness. 35 (29.1%) of patients were found to have lost reflexes and 17 (14.1%) had exaggerated reflexes (8). The current study aimed to assess awareness and perception of Degenerative Cervical Myelopathy among medical students in Aseer region, Saudi Arabia.

Methodology

A descriptive cross-sectional survey was conducted in Aseer region, Southern Saudi Arabia, targeting all medical students and interns at College of Medicine. Students who refused to participate or students with incomplete survey answers were excluded from the study. An online questionnaire was initiated by the study researchers after intensive literature review and

expert's consultation. Questionnaire validity, clarity and applicability were assessed independently by a panel of 3 experts with all modifications done till achieving the final version of the questionnaire. The final questionnaire was published using social media platforms from 1st of September to 3rd of September, 2022. Participants were encouraged to participate in this study by clarifying the degree of confidentiality for their data and the significance of this research to the community. The questionnaire of this study included students' demographic data (Age, Gender, academic year, GPA, and workshop regarding neurological disorders). Part 2 covered participants' awareness of DCM. The last section covered source of students' information regarding the disorder. All questions had one correct answer. The questionnaire was uploaded online by the researchers and their friends, or relatives till no more new answers were obtained.

Data analysis

The data were collected, reviewed and then fed into Statistical Package for Social Sciences version 21 (SPSS: An IBM Company). All statistical methods used were two tailed with alpha level of 0.05 considering significance if P value was less than or equal to 0.05. Overall awareness level regarding DCM was assessed through summing up discrete scores for different correct awareness items. The overall awareness score was categorized as poor level if students' score was less than 60% of the overall score and good level of awareness was considered if the students' score was 60% or more of the overall score. Descriptive analysis was done by prescribing frequency distribution and percentage for study variables including student's personal data, academic year, GPA, training regarding neurological disorders and awareness items, while student's overall awareness level and source of information were graphed. Cross tabulation for showing distribution of student's overall awareness level by their personal data and source of information was carried out with Pearson chi-square test for significance and exact probability test if there were small frequency distributions.

Results

A total of 380 medical students and interns completed the study survey. Students' ages ranged from 18 to 30 years with mean age of 22.6 ± 2.1 years old. Exactly 235 (61.8%) students were females and 212 (55.8%) were at their clinical study years (4th to 6th year) while 98 (25.8%) were interns. As for student's GPA, it was less than 3.5 out of 5 among 144 (37.9%), 3.5-4.4 among 175 (46.1%), and 4.5-5 among 61 (16.1%). A total of 60 (15.8%) had attended a workshop for neurological disorders and 117 (30.8%) has been taught about Degenerative Cervical Myelopathy (Table 1).

Table 2. Medical students' awareness regarding Degenerative Cervical Myelopathy, Saudi Arabia. A total of 42.4% know that DCM is a spinal cord disorder, and only 19.5% know the correct prevalence of that disorder. Exactly 36.6% of the students know that DCM is most reported in the ages i 40-50 years. As for symptoms of DCM, the most

reported were neck pain (69.5%), limb weakness (60.8%), Paresthesia (52.1%), imbalance (46.6%), and clumsy gait (40.3%). Paresthesia was reported as an early sign among cases with DCM by 32.4% students, and 69.7% know that MRI is the best imaging modality to diagnose DCM. Additionally, 36.6% of the students know that 'Snake eyes' is the featured sign for DCM with MRI. As for the average time to diagnose DCM from first presentation, 37.4% of the students reported after 1 month, 32.9% reported after 1 year and only 10.3% said after 2 years. A total of 80.5% of the students think that time to diagnosis affects disease prognosis and 33.2% think surgery improves patients' symptoms. Also, 66.8% of the students were aware that DCM may be asymptomatic with cord compression for years.

Figure 1. Overall awareness level regarding Degenerative Cervical Myelopathy among medical students, Saudi Arabia. Exactly 106 (27.9%) of the students had good awareness level regarding DCM while 274 (72.1%) had poor awareness level.

Figure 2. Source of information regarding Degenerative Cervical Myelopathy among medical students, Saudi Arabia. The most reported source of information was internet (46.3%), followed by lectures (33.9%), social media (30%), textbook (18.9%), and workshop (15.5%).

Table 3. Factors associated with medical students' awareness regarding Degenerative Cervical Myelopathy. Exactly 32.3% of female students had overall good awareness level regarding DCM compared to 20.7% of male students with recorded statistical significance ($P=.014$). Also, 35% of students who were taught about Degenerative Cervical Myelopathy had good awareness level regarding the disease versus 24.7% of others who did not ($P=.038$). Additionally, 35.2% of students who gained their information from the internet had good awareness level versus 33.3% of those who gained it from lectures and 15.3% of others who reported in a workshop ($P=.003$).

Table 1. Personal data of medical students, Saudi Arabia

Personal data	No	%
Age in years		
18-20	65	17.1%
21-24	229	60.3%
25-30	86	22.6%
Gender		
Male	145	38.2%
Female	235	61.8%
Academic phase		
Pre-clinical	70	18.4%
Clinical	212	55.8%
Intern	98	25.8%
GPA		
< 3.5	144	37.9%
3.5-4.4	175	46.1%
4.5-5	61	16.1%
Attended workshop for neurological disorders		
Yes	60	15.8%
No	320	84.2%
Was taught about Degenerative Cervical Myelopathy		
Yes	117	30.8%
No	263	69.2%

Table 2. Medical students' awareness regarding Degenerative Cervical Myelopathy, Saudi Arabia

Awareness items	No	%	
DCM is classified as?	Spinal cord disorder	161	42.4%
	Cervical vertebrae disorder	92	24.2%
	Brian stem disorder	32	8.4%
	Cervical musdes disorder	95	25.0%
What is the prevalence of DCM	0.01%	74	19.5%
	0.1%	120	31.6%
	3.1%	121	31.8%
	4.5%	58	15.3%
	5.1%	7	1.8%
Most reported age for DCM	< 40 years	96	25.3%
	40-50 years	139	36.6%
	> 50 years	145	38.2%
Symptoms might be present in DCM	Clumsy gait	153	40.3%
	Neck pain	264	69.5%
	Falls	122	32.1%
	Imbalance	177	46.6%
	Loss of bowel / urinary control	139	36.6%
	Erectile dysfunction	92	24.2%
	Paresthesia	198	52.1%
	Limb weakness	231	60.8%
These are the early signs among cases with DCM?	Loss of dexterity	72	18.9%
	Paresthesia	123	32.4%
	Limb weakness	76	20.0%
	Incontinence	37	9.7%
What is the best imaging modality to diagnose DCM?	Neck pain	144	37.9%
	MRI	265	69.7%
	CT	33	8.7%
	X-Ray	25	6.6%
	Myelography	48	12.6%
What is the featured sign for DCM with MRI?	Ultrasound	9	2.4%
	Snake eyes appearance	139	36.6%
	Neck shadow	127	33.4%
	Muscle spasms	77	20.3%
What is the average time to diagnose DCM from first presentation?	Brain edema	37	9.7%
	1 week	57	15.0%
	1 month	142	37.4%
	1 year	125	32.9%
	2 years	39	10.3%
Do you think time to diagnosis affects disease prognosis	5 years	17	4.5%
	Yes	306	80.5%
What effect is surgery likely to have on patients' symptoms?	No	74	19.5%
	Improve	126	33.2%
	Stabilize	218	57.4%
DCM may be asymptomatic with cord compression for years	Worsen	36	9.5%
	Yes	254	66.8%
	No	126	33.2%

Figure 1. Overall awareness level regarding Degenerative Cervical Myelopathy among medical students, Saudi Arabia

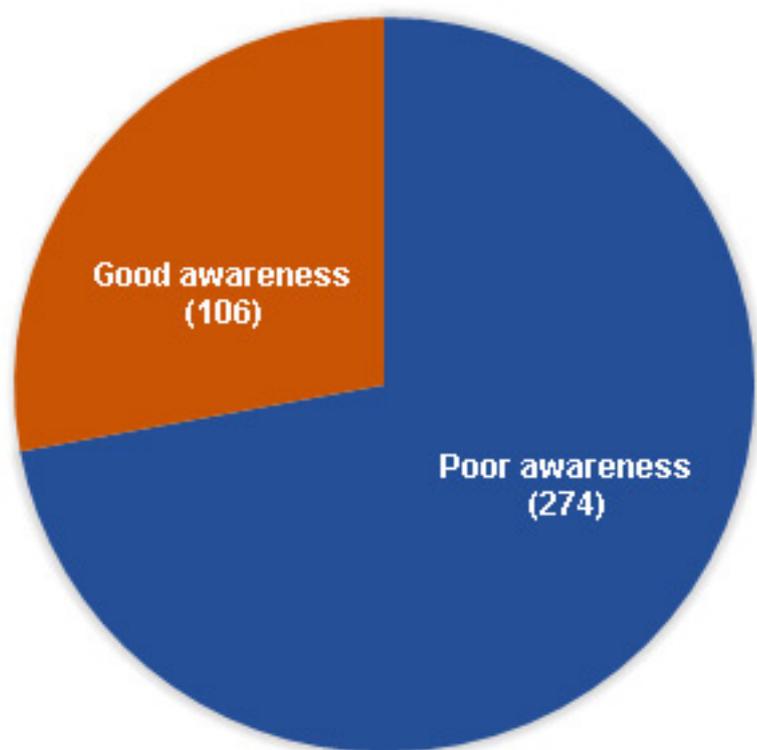


Figure 2. Source of information regarding Degenerative Cervical Myelopathy among medical students, Saudi Arabia

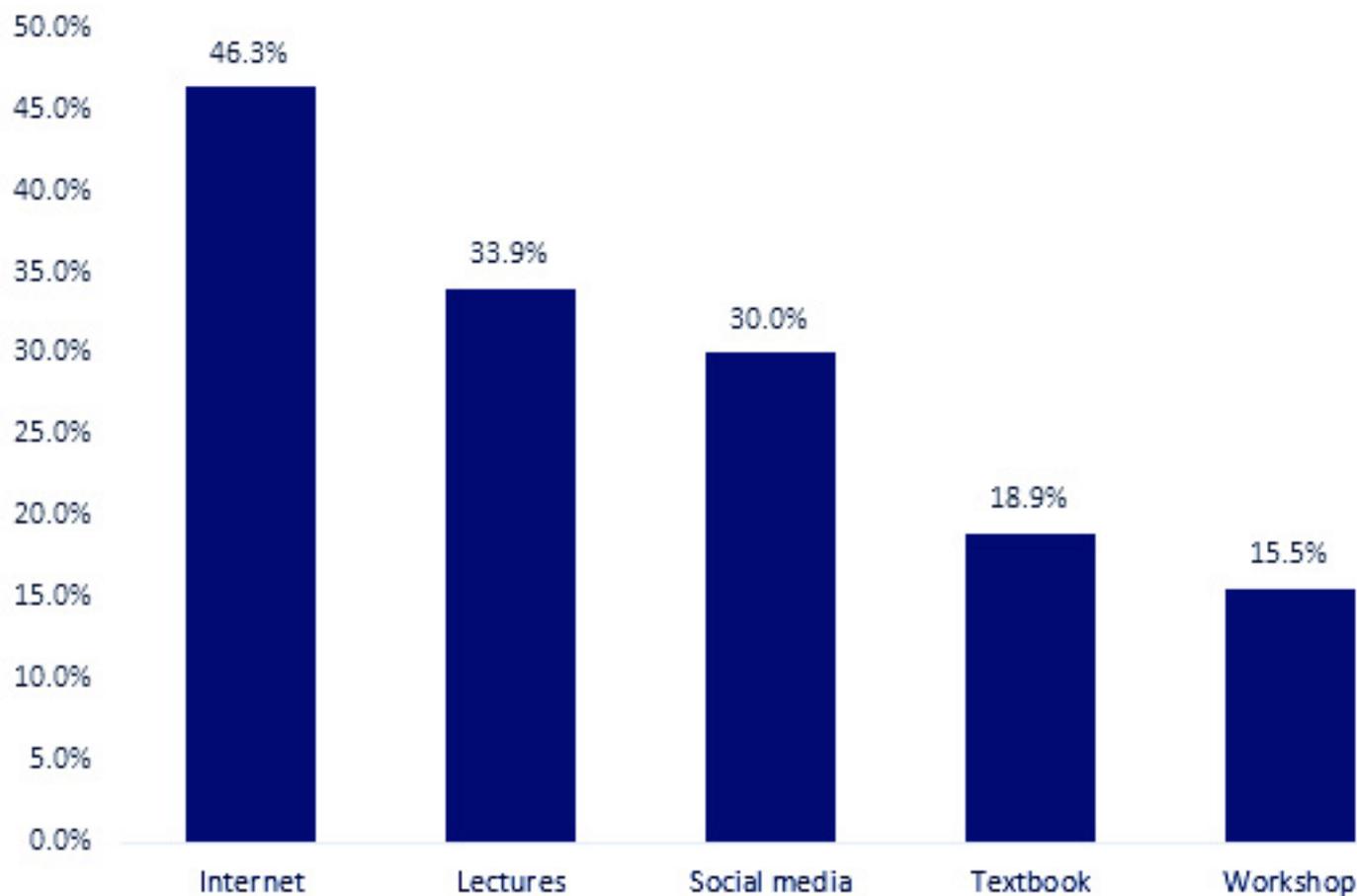


Table 3. Factors associated with medical students' awareness regarding Degenerative Cervical Myelopathy

Factors	Awareness level				p-value
	Poor		Good		
	No	%	No	%	
Age in years					
18-20	48	73.8%	17	26.2%	.840
21-24	166	72.5%	63	27.5%	
25-30	60	69.8%	26	30.2%	
Gender					
Male	115	79.3%	30	20.7%	.014*
Female	159	67.7%	76	32.3%	
Academic phase					
Pre-clinical	54	77.1%	16	22.9%	.576
Clinical	151	71.2%	61	28.8%	
Intern	69	70.4%	29	29.6%	
GPA					
< 3.5	100	69.4%	44	30.6%	.531
3.5-4.4	127	72.6%	48	27.4%	
4.5-5	47	77.0%	14	23.0%	
Attended workshop for neurological disorders"					
Yes	43	71.7%	17	28.3%	.934
No	231	72.2%	89	27.8%	
Was taught about Degenerative Cervical Myelopathy					
Yes	76	65.0%	41	35.0%	.038*
No	198	75.3%	65	24.7%	
Source of information regarding DCM					
Lectures	86	66.7%	43	33.3%	.003*§
Workshop	50	84.7%	9	15.3%	
Textbook	52	72.2%	20	27.8%	
Internet	114	64.8%	62	35.2%	
Social media	78	68.4%	36	31.6%	

P: Pearson X2 test

§: Exact probability test

* P < 0.05 (significant)

Discussion

DCM is mostly a neglected condition in medical education which has repercussions for clinical practice. Though, student interest in undertaking private study suggests future teaching interventions will be well-received (9). More effort is vital to characterize the format of DCM teaching and awareness that is most effective and to subsequently improve future health care staff has the ability for case identification and proper management (10, 11).

The current study aimed to detect the level of medical student' awareness regarding degenerative cervical myopathy, to assess the perception of medical students

about degenerative cervical myopathy, to identify the factors affecting medical students' awareness and perception of degenerative cervical myopathy, and to know about the sources of information regarding degenerative cervical myopathy among medical students. The study results showed that about one-fifth of the medical students were knowledgeable regarding DCM. Higher awareness was reported among female students who were taught about Degenerative Cervical Myelopathy and those who got their information from the internet and lectures. The surprising finding was that most of the students (nearly half of them) had their information from internet which is questionable for medical students but on the other hand lectures were the second highest reported source. This may be explained by that some of the students still in their

pre-clinical years with no lectures are interested in the disorder under study. Similar findings were reported by Brannigan JF et al (12) in UK where most students (72%) had not learned about DCM. Also, a total of 350 students (47%) reported conducting private study on DCM. Modal student self-rating of their own knowledge of DCM was 'terrible' (47%). Also, Waqar M et al (9) found that students and junior trainees had poor knowledge regarding DCM knowledge score. There is a scarcity of articles describing awareness and perception regarding DCM in the literature. DCM issue is a collection of 20 articles written by 46 researchers and surgeons with world-class expertise in the field. The compiled articles form three broad topic areas, which are meant to summarize the current knowledge on the topic. Few articles describe the epidemiology, pathobiology, and natural history of DCM.

Study limitations

Using an online survey increased the likelihood for selection bias which may affect the sample representative of the whole population and validity. Also, information bias might also be present since some questions might be over- or underestimated by the students (those in their pre-clinical academic years).

Conclusion and Recommendations

In conclusion, the current study showed that medical students' awareness regarding DCM was poor especially among male students and others who were not taught about the disease. Also, internet was the most prominent source of students' information rather than study lectures. Awareness level for disease nature, prevalence, and diagnosis age were the most questionable among students. Researchers recommend that health education campaigns and involvement of more lectures should be considered in medical students teaching curricula.

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