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Knowledge and its Associated Factors on Autonomic Dysreflexia among Medical Officers of Selected Hospital of Nepal

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ABSTRACT

Background

Autonomic Dysreflexia (AD) is a life-threatening complication of spinal cord injury above T6 level. It is devastating consequences that may lead to stroke, hypertensive crisis and seizure and trigger by simple noxious stimuli like full bladder, poor bowel clearance and restrictive clothes. So, doctor`s role in AD is early identification, treatment and prevention. This study aimed to assess knowledge regarding Autonomic Dysreflexia among medical officer.

Methods

An analytical cross-sectional study was carried out among 60 Medical Officers working in a selected hospital. Data were collected using census method with a structured self-administered questionnaire. Data were analysed using descriptive and inferntial statistics in SPSS version 16. p-value <0.05 was considered as statistically significant.

Results

The study findings revealed that the mean age of respondents was 27.90±1.95 years. More than half of the respondents (58.3%) had more than 10 years of working experience. Half of them (51.7%) came into contact with a spinal cord injury patient, and 48.3% were not. Almost all (98.3%) had not participated in in-service education on AD. Mean knowledge score was 16.45±3.34, where more than half (58.3%) of respondents had poor knowledge, and only 41.7% had good knowledge regarding AD. There is significant association between levels of knowledge with working area, with respondents working in the emergency department.

Conclusions

The study revealed that medical officers had poor level of knowledge of Autonomic Dysreflexia. Limited formal training was evident among respondents. Regular training and continuing education are recommended to enhance healthcare providers' ability to recognize, prevent, and manage this potentially life-threatening condition.

Keywords: autonomic dysreflexia; spinal cord injury; medical officers; knowledge.

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INTRODUCTION

Autonomic dysreflexia (AD) is a life-threatening response of autonomic nervous system (ANS) characterize by episodic hypertension and accompanying baroreflex-mediated bradycardia caused by unmodulated sympathetic responses in the decentralized cord linked to morbidity and mortality. It is also referred to as AD, AD syndrome, or AD symptom complex.[1,2] AD can arise from injury at or above the sixth thoracic spinal cord segment.[2] It may have detrimental systemic and cardiophysiological effects. For many of these people, this condition is a daily occurrence.[3,4] An estimated 15.4 million persons worldwide had Spinal Cord Injury (SCI) in 2021. One of the fatal complication frequently linked to SCI is autonomic dysreflexia.[5,6] Every year, over 17,000 Americans suffer from SCI which are most vulnerable to AD. About 48% to 70% of people develop AD having SCI above T6 level.[7] Considering the potentially severe consequences of AD, 38 (40%) of the 95 physicians were unable to respond to any of the questions. They have very little information about the diagnosis, treatment, and expertise regarding AD[8,9] Despite being a prevalent illness, AD may not be well-known to many doctors.[10] This study aimed to assess the knowledge and associated factors regarding AD among medical officers in selected hospital.

METHODS

A hospital-based analytical cross-sectional study was conducted to assess the knowledge regarding AD among 60 Medical Officers working at Bharatpur Hospital, Chitwan; Madhyabindu Hospital, Nawalpur; and Lumbini Provincial Hospital, Rupandehi, Butwal, Nepal. Data were collected using the census method. Ethical approval was obtained from the Institutional Review Committee of Bharatpur Hospital (Ref. No. 080/81-022). Informed written consent was obtained from all participating medical officers prior to data collection. A semi-structured questionnaire was used as the data collection tool. Face validity of the instrument was first reviewed by subject experts, and reliability was tested among 10% of the sample size. Data were initially collected using the pre-defined questionnaire, and subsequently checked for completeness and accuracy before entry. Data were then entered and analyzed using SPSS version 16. Knowledge regarding AD was assessed using 20 multiple-choice questions. Each correct response was assigned a score of 1, while incorrect responses were scored as 0. A summative score was calculated, and the mean score was determined. Respondents scoring above the mean were categorized as having good knowledge, while those scoring below the mean were categorized as having poor knowledge. Both descriptive and inferential statistics were applied for analysis. For categorical variables, frequencies and percentages were calculated, whereas for continuous variables, mean and standard deviation were computed. To determine associations between categorical variables, the chi-square test was employed. A p-value of <0.05 was considered statistically significant.

RESULTS

Among the 60 respondents, slightly more than half (51.7%) were above 28 years of age, while 48.3% were below 27 years. The majority were male (70%), and the remaining 30% were female. The mean age of the respondents was 27.90 ± 1.95 years, with a minimum age of 25 years and a maximum of 33 years. With regard to caste/ethnicity, more than half (63.3%) belonged to the Brahmin/Chhetri group. Almost all respondents (96.7%) identified as Hindu, and the majority (81.7%) were unmarried (Table 1).

Regarding the socioeconomic characteristics of the respondents, 73.3% had more than three years of work experience. More than half (51.7%) had been in contact with patients suffering from spinal cord injury, and 46.7% were working in the ICU or NICU wards. The vast majority of respondents (98.3%) had not participated in any training or in-service education programs. In terms of workplace distribution, 43.3% of the respondents were from Bharatpur Hospital, 38.3% from Lumbini Provincial Hospital, and the remaining 18.3% from Madhyabindu Hospital (Table 2).

Table 1. Socio-demographic information of respondents. (n=60)	
Variables	**Frequency (%)**
Age (completed in years)	
25-27	29(48.3)
28-33	31(51.7)
Mean±SD=27.90±1.95, Min=25, Max=33	
Sex	
Male	42(70.0)
Female	18(30.0)
Ethnicity	
Brahmin/Chhetri	38(63.3)
Madhesi	14(23.3)
Janajati	7(11.7)
Dalit	1(1.7)
Religion	
Hindu	58(96.7)
Buddhist	2(3.3)
Marital status	
Unmarried	49(81.7)
Married	11(18.3)

Table 2. Professional related information of respondents. (n=60)	
Variables	**Frequency (%)**
Work experience	
<3 years	16(26.7)
≥3 years	44(73.3)
Contact with SCI patient	
No	29(48.3)
Yes	31(51.7)
Recent Clinical Area	
Emergency	21(35.0)
ICU and NICU	28(46.7)
General wards	11(18.3)
Training/In-service education on AD	
No	59(98.3)
Yes	1(1.7)
Location of practice	
Bharatpur Hospital	26(43.3)
Lumbini province Hospital	23(38.3)
Madhyabindu Hospital	11(18.3)

Most of the respondents (85%) correctly identified AD as a disorder of the autonomic nervous system associated with spinal cord injury above the T6 level. Nearly all respondents (95%) reported that injury above T6 is the common site leading to AD. Similarly, 96.7% recognized spinal cord injury above T6 as the most common cause of AD, and an equal proportion (96.7%) identified noxious stimuli as the major triggering factor for AD (Table 3).

Table 3. Knowledge regarding general information and causes of AD. (n=60)	
Variables	**Frequency (%)**
Autonomic Dysreflexia is	
Disorder of autonomic nervous system with spinal cord injury above T6	51(85.0)
Sympathetic nervous system dysfunction	9(15.0)
Common parts lead to AD	
Above T6	57(95.0)
At the area of sacral region	3(5.0)
Common cause of AD	
Spinal cord injury above T6 level	58(96.7)
Hypotension	2(3.3)
Triggering factor of AD	
Noxious stimuli	58(96.7)
Frequent checking of reflexes	2(3.3)

Based on the correct responses regarding signs, symptoms, and diagnosis of AD, less than half of the respondents identified bradycardia (38.8%), stuffy nose (32.8%), and piloerection above the level of spinal cord injury (24.1%) as symptoms of AD. Similarly, 43.3% of respondents recognized excessive sweating above the level of injury as a cardinal feature of AD. With regard to parameters that rise during the onset of AD, the majority (86.7%) correctly identified blood pressure. In terms of diagnostic methods, 40.0% of respondents reported that urine tests aid in diagnosis, while most (81.7%) stated that conducting a neurological examination is the first step in the diagnostic process (Table 4).

With regard to knowledge on prevention and management of AD, most respondents (91.7%) reported that avoiding noxious stimuli is the key preventive measure, while 88.3% identified the High Fowler's position as the recommended posture for individuals experiencing AD. Concerning management practices during an episode of AD (multiple responses allowed), 44.7% of respondents stated maintaining the High Fowler's position, 27.2% reported loosening restrictive clothing, and 24.6%

Table 4. Respondent's knowledge regarding sign, symptom and diagnosis of AD. (n=60)	
Variables	**Frequency (%)**
Symptoms of AD**	
Bradycardia**	54(90.0)
Piloerection above the level of injury**	6(10)
Stuffy nose**	38(32.8)
Hypotension	5(4.3)
Cardinal features of AD	
Excessive sweating above the injury	26(43.3)
Severe headache	34(56.7)
Parameter rise during	
Blood pressure	52(86.7)
Heart rate	8(13.3)
Factor aid to diagnose AD	
Clinical feature	35(58.3)
Urine test	24(40.0)
Eye test	1(1.7)
Recommended first step in the diagnostic process	
Conducting a neurological examination	49(81.7)
Obtaining a detailed medical history	7(11.7)
Performing a chest X-ray	3(5.0)
Ordering a complete blood count (CBC)	1(1.7)

***Multiple response*

Table 5. Respondent's Knowledge Regarding Prevention and Management of AD. (n=60)	
Variables	**Frequency (%)**
Intervention to prevent occurrence of AD	
Avoid noxious stimuli	55(91.7)
Avoid smoking	4(6.7)
Nutritious diet	1(1.7)
Position while experiencing AD	
High fowler's	3(5.0)
Trendelenburg	3(5.0)
Supine position	21(35.0)
Management during the period of AD**	
Maintain High fowelrs position**	51(44.7)
Loosen the restrictive clothes**	31(27.2)
Immediately empty bladder**	8(24.6)
Medication should prescribed	
Captopril	42(70.0)
Atrovastatin	17(28.3)
Methimazole	1(1.7)
Healthcare professional who coordinating the long-term management of AD	
Neurologist	34(56.7)
Rehabilitation specialist	13(21.7)
Physical therapist	11(18.3)
Urologist	2(3.3)

***Multiple response*

mentioned immediate bladder emptying. In terms of pharmacological management, 70% of respondents identified captopril as the appropriate medication. Regarding the healthcare professional responsible for the long-term management of AD, only 21.7% of respondents selected a rehabilitation specialist (Table 5).

Regarding knowledge of complications and patient advice, only a small proportion of respondents (11.7%) correctly identified urinary tract infection as a complication of AD. More than half (56.7%) correctly recognized another complication, while 66.7% reported hypertensive crisis as an initial complication. The majority of respondents (93.3%) acknowledged stroke as a potential complication if AD remains

Table 6. Respondent's knowledge regarding complication and advise to patient. (n=60)	
Variables	**Frequency (%)**
Symptoms suggestive of AD	
Migraine headache	34(56.7)
Heat exhaustion	9(15.0)
Urinary tract infection	7(11.7)
Condition Differentiated AD from Neurogenic shock	
Increase blood pressure	34(56.7)
Cool clammy skin	24(40.0)
Bradycardia	1(1.7)
Diaphorosis	1(1.7)
Initial Complication	
Hypertensive crisis	40(66.7)
Diaphoresis	17(28.3)
Tachycardia	3(5)
Potential complication of untreated AD	
Stroke	56(93.3)
Bradycardia	4(6.7)
Lifestyle modifications	
Limiting physical activity	38(63.3)
Adequate bowel and bladder management	21(35.0)
Avoiding regular blood pressure monitoring	1(1.7)
Discharge Teaching	
Avoid regular blood pressure monitoring	20(33.3)
Providing list of high-sodium foods	19(31.7)
Information on the use of emergency medications	17(28.3)
Advising against follow-up	4(6.7)

untreated. In terms of lifestyle modifications, less than half (35.0%) reported ensuring adequate bowel and bladder management. Similarly, only 28.3% of respondents identified providing information on the use of emergency medications as part of discharge teaching for patients (Table 6).

Regarding the overall level of knowledge on Autonomic Dysreflexia, less than half of the respondents (41.7%) scored above the mean, reflecting a relatively better understanding. In contrast, more than half (58.3%) scored below the mean, indicating a poorer level of knowledge on Autonomic Dysreflexia (Table 7).

The study revealed a statistically significant association between knowledge and working area, with respondents working in the emergency department demonstrating better knowledge compared to those in other areas. However, no statistically significant associations were observed between other socio-demographic variables and the level of knowledge regarding Autonomic Dysreflexia (Table 8).

Table 7. Respondent's level of knowledge regarding autonomic dysreflexia. (n=60)

Level of knowledge	Frequency (%)
Above mean score (Good)	25(41.7)
Below mean score (Poor)	35(58.3)

Mean ± SD =16.45±3.34, Min=11 and Max=25

Table 8. Association between knowledge and socio-demographic variable. (n=60)

Variables	Good n(%)	Poor n(%)	p-value
Age(years)			
25-27	48.3(48.3)	15(51.7)	0.315
28-33	11(35.5)	20 (64.5)	
Sex			
Male	18(42.9)	24(57.1)	0.775
Female	7(38.9)	11(61.1)	
Ethnicity			
Brahmin/Chhetri	18(47.4)	20(52.6)	0.239
Janajati/Madhesi/Dalit	7(31.8)	15(68.2)	
Marital status			
Unmarried	20(40.7)	29(59.2)	0.778
Married	5(45.5)	6(54.5)	
Working area			
ICU & NICU	11(39.3)	17(60.7)	0.016*
ER	13(61.9)	8(38.1)	
General wards	1(9.1)	10(90.9)	
Worked with a Spinal Cord Injury patient			
Yes	11(35.5)	20(64.5)	0.315
No	14(48.3)	15(51.7)	
Working experience			
<3 years	9(56.3)	7(43.8)	0.167
≥3 years	16(36.4)	28(63.6)	

Note: p-value <0.05 statistically significant,
**Fisher's exact test*

DISCUSSION

Autonomic dysreflexia is one of the potentially fatal condition which is very common and a number of patients appeared to be asymptomatic.[11,12] Regarding socio-demographic information, this study shows that out of sixty respondents, majority (48.3%) of them were belongs to age group less than 27 years and 51.7% belongs to age of above 28 years where mean age was 27.90±1.95 years. Majority (70.0%) of respondents were male and 30.0% were female. The findings of this study regarding the respondents age and sex is contrary in the study where the mean age of the participants was 33.3±8.2 years and 37.9±9.2 years where as 57.0% of respondents were male and 43.0% of respondents were female.[8,9] Regarding work experience, 73.3% of respondents had more than 3 years of experiences among them 51.7% had contact with spinal cord injury (SCI) patient. Nearly same 49.5%[13] had seen AD patient. Regarding training and in-service education nearly all (98.3%) of them did not participate on any training in contrast with this findings, 27%[8] and 35.26% [13] had training and experiences and 18%,[8] had contact with patient with AD or SCI. Finding of the study showed majority (85.0%) of respondents correctly answered about definition of AD, 96.7% knew noxious stimuli for triggering AD, 70.0% of the respondents answered captopril is choice of drug and regarding triggering factor, 21.7% correctly answered rehabilitation specialist coordinate the long term management. These findings are contrary to study conducted by Dogruoz Karatekin et al., in which 55.4% of respondents

answered correctly definition of AD, 65.3% said level of SCI as triggering factors, 34.7% of the respondents answered captopril is choice of drugs, and only 12.4% answered that they request a Physical Medicine and Rehabilitation.[9] Regarding level of knowledge, 41.7% had above mean reflecting good knowledge and 58.3% had below mean indicating poor knowledge, whereas mean score is 16.45±3.34. This finding is supported by a study revealed the insufficient knowledge of physicians on this subject.[9] Another study showed family physicians are unfamiliar to AD,[14] while the prevention of AD is major challenge.[15] The study found statistically significant associate between knowledge and working area (p-value=0.06), whereas respondents working in emergency demonstrate good knowledge then other area.

Limitations

The small sample size limits the generalizability of the findings to the wider population of healthcare professionals. Additionally, the cross-sectional design captures knowledge at only one point in time, which may not reflect changes or trends. The study os further constrained by its exclusive focus on medical officers, excluding other relevant healthcare roles.

CONCLUSIONS

This study explored the knowledge of Autonomic Dysreflexia among medical officers in selected hospitals of Nepal. The findings indicate that most respondents were aware of the definition of AD and its primary pharmacological management, meanwhile, gaps remain in understanding specific symptoms, complications, and long-term care. Most medical officers had limited formal training or in-service education on AD, highlighting the need for targeted educational programs. Regular training and continuing education should be implemented to enhance healthcare providers' competence in recognizing, preventing, and managing this potentially life-threatening condition.

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