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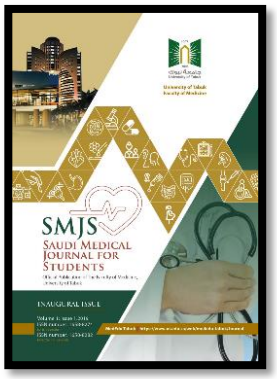

Original Research Article

VASOVAGAL SYNCOPE AMONG UNDERGRADUATE SAUDI MEDICAL STUDENTS.

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ABSTRACT

Background: Syncope is a sudden, brief loss of consciousness and postural tone with spontaneous recovery without therapy. About 30% of the total population experienced syncope. Studies found that one out of ten medical students will faint or experience prodromal symptoms in the theatre room. Our objective to determine the frequency of vasovagal syncope among medical students and medical Interns in Saudi Arabia.

Methods: a cross-sectional study was done at Taif University, Faculty of Medicine, Taif city, Saudi Arabia. A total of 555 medical students in Saudi Arabia, during the period from August to October 2017. Data were collected using a predesigned questionnaire to collect sociodemographic data, Calgary score to detect and diagnose vasovagal syncope.

Results: 35.9% of students reported fainting at least once. 87 % were diagnosed as vasovagal syncope. Females found to be more prone to vasovagal syncope twice as males 63%, 37%, respectively. Stress found to be the most reported trigger followed by attending surgery and emergency trauma case. 35.3% of students with vasovagal syncope had a family history of fainters, but no association were found P-value>0.05

Conclusion: The prevalence of vasovagal syncope among medical students is similar to that of the general population, as it is about one-third. No significant relation between gender and vasovagal syncope P-value>0.05, as well as the level triggers and family history.

KEYWORDS: Medical students, Prevalence, Vasovagal syncope, syncope, Saudi Arabia

INTRODUCTION

Background

Syncope is a "medical manifestation of a short-term interruption of global cerebral perfusion and well-defined as sudden, loss of consciousness and postural tone with spontaneous recovery without therapy."

Vasovagal syncope (VVS) was described as a "transitory loss of consciousness triggered by specific causative factors of emotional distress or orthostatic stress."[1] Most students, when introduced for the first time to the theatre room, experience such negative feelings like anxiety, fear, apprehension, and shame.[2] Although there is a strong interest in surgical specialties among young medical students, there has been a decrease in the applicants over the last years.[3,4,5] Although it is difficult to identify all contributing factors to this trend, lifestyle and student's past experiences are important factors.[3,5,6] This necessitates a well understanding of the occurrence of VVS, as it is affecting student's experience about surgical specialties and the operation room.[3,7] The warm environment, along with the long-standing hours at the theatre room are common triggers (contributing factors) for VVS, as well other factors like stress, decrease blood glucose, and physical exhaustion [3,8,9] Studies found that out of ten medical students, one of them will faint or experience prodromal symptoms at theatre room.[3,9] VVS is a common health issue, and it is not limited to the medical field only, as about 30% of the total population also affected. [8,10-12] The literature lacks studies assess the VVS in kingdom of Saudi Arabia in our knowledge, we expect that the prevalence of VVS among medical students is much higher than the previously mentioned. Despite this, there is no orientation, education, or advice to the medical students at the beginning of surgical modules.[3,13] This might affect student's health, experience, as well as patient safety, if they were enrolled in the operation team, or might cause distraction of the operators by their faints. Which increases the need for their education and orientation to prevent these events. Studies found that females were more affected by VVS than males, as well they have less tendency to choose surgical specialties than melas.[3,9,14] Although lifestyle is a considerable factor affecting the decision of future career, it found to be unlikely to affect female's decision.[3,15]

We aim to determine the frequency of VVS events and their association with sociodemographic characteristics among medical students in Saudi Arabia.

MATERIAL AND METHODS

Study Design

This is a cross-sectional study of 555 individuals carried out among medical students in Saudi Arabia, during the period from August 2017 to October 2017. There are 28 medical colleges in Saudi Arabia, with 6842 graduates submitted for the Saudi board program in 2016 (Saudi Commission for Health Specialties).

Inclusion criteria

- Age: Between 22 and 27 years.
- Male and female.
- Medical students or intern

Exclusion criteria

- Any specialty other than medicine.
- Participants with a history of epilepsy.
- First-year students.

Methods and procedures

Data were collected by a structured online questionnaire cast through social media (WhatsApp) for medical students only and from all Saudi Arabia regions (North, South, East, and West regions).A multistage cluster sampling technique used to recruit the participants in this study.
First stage: medical students and interns from all Saudi Arabia from different universities and regions and levels except first years' where involved.
Second stage: students divided into two main groups according to their phase: preclinical (2nd, 3rd, and 4th year), clinical (5th, 6th, and internship year).
Third stage: groups on social media were formed, and the involved students were joined randomly to these groups. Each group contains students from different regions, cities, and universities, but in the same phase. we restricted age to reduce the bias, as medical students cant apply for medical school until they are 23 of age and most graduate before age of 27, simply it's the natural age for medical students.
Fourth stage: the online questionnaire cast through all the groups in the same period, and the students were asked to fill the questionnaire.

Data collection:

A predesigned questionnaire used for data collection including following parts:
1- The first part contains questions about sociodemographic data. (gender, age, specialty, and year of study).
2- The second part is the Calgary score for the diagnosis of vasovagal syncope, and it is preceded by questions about the triggers and family history of the faints. Also, an exclusion question for any history of epilepsy is involved.
The Calgary score is an alternative instrument for the diagnosis of vasovagal syncope in patients with a healthy heart with high sensitivity up to 92%, especially among patients under 50 years and specificity of 40.5%.[15,16]
Students were informed about having the right to leave the groups or the study at any stage, and not forced to fill the questionnaire. A pilot study conducted before sharing the questionnaire, for the detection of the difficulties.

Ethical considerations

The Research Ethics Committee approved this study of Taif University.

Statistical analysis

The data were collected and entered in Microsoft Excel 2016 and were analyzed using a Statistical Package for the Social Science version 22. Prevalence and categorical variables were reported as count and percentage, while continuous variables were reported as mean ± standard deviation, maximum and minimum value. Chi-square and t-tests used to assess the association between VVS and sociodemographic characteristics. Statistical tests were significant if $P < 0.05$.

RESULTS

Our study involved 555 students (41.4%) males and (58.6%) females. The mean age was 22.6 ± 1.7, Age of fainters 22.7± 1.7, The mean age of onset 16.7±5. Most of the participated students were from the sixth year (22.5%). Out of all participants (35.9%) reported at least one faint, as shown in [Table 1]. Most of the fainter were females (64.3%). The highest prevalence of faints was among sixth-year students (25.1%), and the lowest was among 2nd-year students (4%). Most of the fainters reported stress as the cause of their faints (30.2%), and (3.5%) were unable to choose a proper cause of their faints. (34.7%) of fainters were having a family history with faints, as shown in [Table 2]. Most of the fainters diagnosed with VVS were females (63%) rather than males; however, that was not statistically significant P-value>0.05. Most of the students diagnosed with VVS was the sixth-year students (25.4%) followed by internship (23.1%) which was not significant to P-value>0.05 The most frequently reported trigger for VVS was stress (32.2%) followed by exposure to pain or medical procedures like needle injection or blood

sampling (21.4%) and the least frequent was attending anatomy session (2.3%), but none of which were significant P-value>0.05 respectively. (35.3%) of students with VVS were having a family history of faints P-value>0.05, as shown in [Table 3].

DISCUSSION

VVS is the commonest cause of syncope, especially among medical students, as 30% of them have experienced it.[8,11] Our study found that 35.9% of students have fainted at least once, out of the 87% were diagnosed as VVS, which is consistent with the incidence mentioned in the previous study, as well to be the most common cause of syncope among our study population. Another study reported a similar prevalence (32%) among medical students as well, which concludes that the incidence and prevalence of VVS among medical students is almost the same.[8,11,18,19] While regarding the incidence among the general population aged 35-60 years, it also found to be almost the same (35%).[10] Therefore, there is no difference in VVS occurrence between the general population and medical students, neither between young individuals and older individuals.[8,10,11,18,19] The prevalence of VVS among females found to be twice higher than males 63% Versus 37% which is consistent with other studies,[8,10,11,18] the possible reason behind this variation is suggested by some authors as a result of decreased cardiac filing time,[20] or it might be owed to the higher prevalence of stress among females medicals students as its one of the known triggers of VVS.[21] However, that was not statistically significant, as found in our study P-value>0.05 in contrary to the other studies. Among all students, the sixth year's found to have the highest prevalence of VVS (25.4%) followed by intern year's students (23.1%). While regarding triggers, stress found to be the most frequently reported 31.2%, while it was the warm environment among the general population,[10] this difference is due to the high prevalence of stress among medical students, especially among females.[21] However, neither the level nor the trigger found to be statistically significant in our study P-value>0.05, 0.406, respectively. Other triggers reported as well, as exposure to pain or medical procedure is the second most common (21.4%), followed by attending surgery or trauma case (12.1%). In comparison, medical students seem to experience VVS more often than surgeons inside the operation room, as only 4.7% reported syncope.[22] However, it was not significant P-value>0.05 Family history and genetics found to be significantly related and affect the occurrence of VVS and significantly increase its risk. [18,23,24] Although 35.3% of our students with VVS reported a family history of fainting parents, no significant association was found P-value>0.05, which is the contrary of the previously mentioned studies. A family history of faints provides a subjective and unreliable history, as it is influenced by memory and knowledge about parents' history, which affects the actual occurrence of the event. Therefore, it is advised for future studies to imply a Calgary score questionnaire for parents to detect a more precise history and diagnosis.

Limitations

The reliance on a self-administers questionnaire and the use of the social media for data collection beside family history of faints provides a subjective and unreliable history, as it is influenced by memory and knowledge about parents' history, which affects the actual occurrence of the event. Therefore, it is advised for future studies to imply a Calgary score questionnaire for parents to detect a more precise history and diagnosis.

CONCLUSION

The prevalence of VVS among medical students is similar to that of the general population, as its about one-third. Females found to be affected twice than males, although no significant relation was found P-value>0.05 Sixth-year students were more exposed, and the most common trigger found to be psychological stress — no significant association between family history of faint and the diagnosis of VVS.

REFERENCES

1. Saklani P, Krahn A, Klein G (2013) Syncope. Circulation 127: 1330–1339.
2. Bowrey DJ, Kidd JM. How do early emotional experiences in the operating theatre influence medical student learning in this environment? Teach Learn Med. 2014;26(2):113-120.
3. Morzycki A, Hudson A, Williams J. Medical student presyncope and syncope in the operating room: a mixed methods analysis. Journal of surgical education. 2016 Nov 1;73(6):1004-13.
4. Alawad A, Khan W. Surgery as a career choice among medical students at University of Medical Sciences & Technology. Sudan Med J. 2014;541(1):26-31.
5. Marshall DC, Salciccioli JD, Walton S-J, Pitkin J, Shalhoub J, Malietzis G. Medical student experience in surgery influences their career choices: a systematic review of the literature. J Surg Educ. 2015;72(3):438-445.
6. Erzurum VZ, Obermeyer RJ, Fecher A, et al. What influences medical students' choice of surgical careers. Surgery. 2000;128(2):253-256.
7. Ek EW, Ek ET, Mackay SD. Undergraduate experience of surgical teaching and its influence on career choice. ANZ J Surg. 2005;75(8):713-718.
8. Ganzeboom KS, Colman N, Reitsma JB, Shen WK, Wieling W. Prevalence and triggers of syncope in medical students. Am J Cardiol 2003; 91:1006–1008.
9. Jamjoom A, Nikkar-Esfahani A, Fitzgerald J. Operating theatre related syncope in medical students: a cross sectional study. BMC Med Educ. 2009;9(1):14.
10. Ganzeboom KS, Mairuhu G, Reitsma JB, Linzer M, Wieling W, van Dijk N. Lifetime cumulative incidence of syncope in the general population: A study of 549 Dutch subjects aged 35–60 years. J Cardiovasc Electrophysiol 2006; 17:1172–1176.
11. Colman N, Nahm K, Ganzeboom KS, Shen WK, Reitsma J, Linzer M, Wieling W. et al. (Epidemiology of reflex syncope). Clin Auton Res 2004; 114(Suppl):9–17.
12. WielingW, Ganzeboom KS, Saul JP. Reflex syncope in children and adolescents. Heart 2004; 90:1094–1100.
13. Seabrook MA, Woodfield SJ, Papagrigoriadis S, Rennie JA, Atherton A, Lawson M. Consistency of teaching in parallel surgical firms: an audit of student experience at one medical school. Med Educ. 2000;34 (4):292-298.
14. Baxter N, Cohen R, McLeod R. The impact of gender on the choice of surgery as a career. Am J Surg. 1996;172 (4):373-376.
15. Wendel TM, Godellas CV, Prinz RA, Scott-Conner C, Estes NC, Pollak R. Are there gender differences in choosing a surgical career? Surgery. 2003;134(4):591-598.
16. Castaño-Morales Jhonny A, Lopera-Valle Johan S, Vanegas-Elorza Daniel A, Cañas-Arenas Eliana M, González-Rivera Edgardo. Escala de Calgary para el diagnóstico del síncope vasovagal. Estudio de pruebas diagnósticas. Rev. Colomb. Cardiol. 2015; 22(4): 162-168.
17. Romme JJ, van Dijk N, Boer KR, Bossuyt PM, Wieling W, Reitsma JB. Diagnosing vasovagal syncope based on quantitative history-taking: validation of the Calgary Syncope Symptom Score. European heart journal. 2009 Aug 17;30(23):2888-96.

18. Serletis A, Rose S, Sheldon AG, Sheldon RS. Vasovagal syncope in medical students and their first-degree relatives. European heart journal. 2006 Jul 12;27(16):1965-70.
19. Kenny RA, Bhangu J, King-Kallimanis BL. Epidemiology of syncope/collapse in younger and older Western patient populations. Progress in cardiovascular diseases. 2013 Jan 1;55(4):357-63.
20. Fu Q, Arbab-Zadeh A, Perhonen MA, Zhang R, Zuckerman JH, Levine BD. Hemodynamics of orthostatic intolerance: implications for gender differences. American Journal of Physiology-Heart and Circulatory Physiology. 2004 Jan;286(1):H449-57.
21. Dahlin M, Joneborg N, Runeson B. Stress and depression among medical students: A cross-sectional study. Medical education. 2005 Jun;39(6):594-604.
22. Rudnicki J, Zyśko D, Gajek J, Kuliczkowski W, ROSIŃCZUK-TONDERYS JO, Zielińska D, Terpiłowski Ł, Agrawal AK. The risk for syncope and presyncope during surgery in surgeons and nurses. Pacing and Clinical Electrophysiology. 2011 Nov;34(11):1486-91.
23. Mathias CJ, Deguchi K, Bleasdale-Barr K, Kimber JR. Frequency of family history in vasovagal syncope. The Lancet. 1998 Jul 4;352(9121):33-4.
24. Newton JL, Kenny R, Lawson J, Frearson R, Donaldson P. Prevalence of family history in vasovagal syncope and haemodynamic response to head up tilt in first degree relatives. Clinical Autonomic Research. 2003 Feb 1;13(1):22-6.

Table 1 General characteristics of the study participants

Variables		Frequency (%)
Gender	Male	230 (41.4%)
	Female	325 (58.6%)
Level	2nd year	44 (7.9%)
	3rd year	84 (15.1%)
	4th year	104 (18.7%)
	5th year	86 (15.5%)
	6th year	125 (22.5%)
	internship	112 (20.2%)
In your lifetime, have you ever fainted?	Yes (Fainters)	199 (35.9%)
	NO	356 (64.1%)

Table 2. General characteristics of fainters.

Variables		Frequency (%)
Gender	Male	71 (35.7%)
	Female	128 (64.3%)
Level	2nd year	8 (4%)
	3rd year	28 (14.1%)
	4th year	39 (19.6%)
	5th year	31 (15.6%)
	6th year	50 (25.1%)
	Internship	43 (21.6%)
Triggers	Stress	60(30.2%)
	Attending Surgery	26(13.1%)
	Emergency trauma case	23(11.6%)
	Pain exposure or medical procedure	42(21.1%)
	Anatomy session	4(2%)
	Receiving bad news	17(8.5%)
	Others	83(41.7%)
	No idea	7(3.5%)
Family history of Fainting?	Yes	69(34.7%)
	NO	130(65.3%)

Table 3. The association between VVS and general characteristics.

Variables		VVS 173 (87%)	Not VVS 26 (13%)	Chi-square	p-value
Gender	Male	64 (37%)	7 (26.9%)	0.842	0.359
	Female	109 (63%)	19 (73.1%)		
Level	2nd year	6 (3.5%)	2 (7.7%)	5.329	0.377
	3rd year	25 (14.5%)	3 (11.5%)		
	4th year	32 (18.5%)	7 (26.9%)		
	5th year	26 (15%)	5 (19.2%)		
	6th year	44 (25.4%)	6 (23.1%)		
	Internship	40 (23.1%)	3 (11.5%)		
Triggers	Stress	54 (31.2%)	6 (23.1%)	0.690	0.406
	Surgery	21 (12.1%)	5 (19.2%)	1.670	0.196
	Emergency trauma case	21 (12.1%)	2 (7.7%)	0.756	0.384
	Pain exposure or medical procedure	37 (21.4%)	5 (19.2%)	0.219	0.640
	Anatomy session	4 (2.3%)	0	0.672	0.412
	Receiving bad news	14 (8.1%)	3 (11.5%)	0.187	0.665
	Others	71 (41%)	12 (46.2%)	0.207	0.649
	No idea	6 (3.5%)	1 (3.8%)	0.000	0.991
Family History	Yes	61 (35.3%)	8 (30.8%)	0.558	0.455
	No	112 (64.7%)	18 (69.2%)		