Medical Student's Awareness and Perceptions of Massive Media Coverage on Fatality After Spider Bite in Thailand

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ABSTRACT

Objective: To evaluate the level of awareness amongst medical students in regard to a recently reported fatal spider bite in Thailand. To determine whether the students accurately understood the reported news.

Methods: This cross-sectional survey was conducted in the Faculty of Medicine Siriraj Hospital, Mahidol University, Thailand. Participants included medical students who studied during July 2014. Self-administered questionnaires were distributed to medical students from August 2015 to March 2016.

Results: Of the 1104 questionnaires distributed, 532 students responded (48.2%). The mean age was 22.5 years (SD ± 1.5 years). Only 212 participants (40%) indicated awareness of the reported news, with the least proportion being 2nd year students (29.1%, p=0.014). Of the 212 students who reported awareness of the news, only 116 (55.2%) perceived it correctly. Correct perception of the news was most prevalent amongst 6th year medical students (65.7%). It was noted that all respondents had one or more lessons covering animal toxins, including spiders, but only 64(12.1%) were able to recall this fact.

Conclusion: The majority of students who participated in this study were either unaware of the news concerning fatal spider bite, or were aware but had misunderstood the reported facts. This occurred despite intense media coverage of this incident. It is therefore proposed that the medical curriculum should be designed to enable students to have more time for extra-curricular activities, especially those which relate directly to their field of study.

Keywords: Spider; medical student; envenomation; media; Brown recluse (Siriraj Med J 2017;69: 175-180)

INTRODUCTION

Medical students are exposed to variety of stressors such as extensive curriculum, frequent examinations, sleep deprivation and high expectation of academic performance. The prevalence of anxiety and depression in medical students is higher than their non-medical peers and the general population.[1] These can negatively affect personal accomplishment, academic performance, and empathy toward patients. It can also lead to poor health and cause many to consider giving up on their studies.[2,3]

Typically, medical students are highly motivated to achieve their academic goals. They often markedly decrease time spent in leisure and recreational activities, and spend long hours in study, completing assignments and seeing patients.[4] While this generally reflects a desire to be effective in their future career as doctors, in some cases it may also reflect a lack of confidence in their abilities.[5]

In July 2014, the death of a 44-year-old male patient following a spider bite was extensively reported in the Thai media. Over a three-week period the case was widely covered by newspaper, radio and television, as well as on social media. One of the authors (TJ) was professionally consulted as the toxicologist on this case. In conjunction

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with an entomologist, we personally examined the index spiders, and were among a team of spider experts who carried out a spider survey at the patient's house and surrounding village. Despite expert advice and a public health survey revealing that the spider was non-toxic, there was significant concern amongst the general public that the spider involved was a Brown recluse spider. This concern arose because of the severe skin infection suffered by the patient. At the time of reporting, the Brown recluse spider was not known to exist in Thailand. Formal press releases concerning this case were performed by one of the authors (TJ), and other relevant experts, on three occasions during the three-week period. These included a number of interviews on Thai media. This news would have been hard to miss for anyone who read, watched or listened to the news during those 3 weeks.

This study aimed to evaluate the level of awareness of this fatal case, amongst the medical students enrolled in the Faculty of Medicine Siriraj Hospital in July 2014. It also aimed to determine the students' understanding of the case as derived from the news, and their knowledge concerning spiders in Thailand.

MATERIALS AND METHODS

A cross-sectional survey was conducted in the Faculty of Medicine Siriraj Hospital, Mahidol University, Thailand. Participants included only medical students who were enrolled in the Faculty of Medicine Siriraj Hospital in July 2014, and who attended academic activities provided by the Department of Preventive and Social Medicine between August 2015 and March 2016. Students invited to take part in the survey consisted only of those in years 2 and 3 (pre-clinical) or years 5 and 6 (clinical), during July 2014. Over the 8-month period, self-administered questionnaires were distributed to 1104 medical students, on campus, prior to the start of lessons. In order to avoid undue influence, participants could freely choose to complete and return the questionnaire into a designated box on a voluntary basis. Each participant could return the questionnaire only once.

The questionnaire consisted of questions regarding the participants' demographic data, and personal experience with spiders. Questions also pertained to perception and awareness of the specific case, and specific knowledge concerning spider envenomation and management.

The study protocol and questionnaire were approved by Siriraj Institutional Review Board, Faculty of Medicine Siriraj Hospital, Mahidol University (Si 422/2015).

Data analysis was performed using SPSS version 18.0. Descriptive statistics were used on demographic data, personal experience, awareness, perception and specific knowledge about spiders. Chi-square was used to compare between groups. Relationship between variables measured with a $p \leq 0.05$ was considered statistically significant. All data are demonstrated in the relevant Tables.

RESULTS

The survey was performed from August 2015 to March 2016. Overall 532 students completed and returned the questionnaire (48.2% response rate). Of these, 212 were students in pre-clinical years (39.8 %), and 320 from clinical years (60.2%). The mean age of all respondents was 22.5 years with standard deviation of 1.5 years. The number, percentage, response rate and gender of medical students from each year are shown in Table 1.

TABLE 1. The characteristics of respondents.

Year in July 2014	(n)	Response rate respondents	Percentage of Female (n)	Percentage of
Classified by Period as Pre-clinical or Clinical	Pre-clinical (Year 2 & 3)	39.8% (212/533)	39.8%	55.2% (117/212)
	Clinical (Year 5 & 6)	56.0% (320/571)	60.2%	49.4% (158/320)
Classified by Year in Medical School	2	20.1% (65/315)	12.2%	55.4% (36/65)
	3	67.4% (147/218)	27.6%	55.1% (81/147)
	5	73.5% (180/245)	33.9%	46.7% (84/180)
	6	42.9% (140/326)	26.3%	52.9% (74/140)
Total		48.2% (532/1104)	100%	51.7% (275/532)

Of the 532 respondents, 530 responded to the question of whether or not they were aware of the particular case. This included 257 male, and 273 female respondents. Of these 530 respondents, only 212 (40%) confirmed awareness of the specific case. Of all respondents from year 2, only 19 of 65 (29.13%) indicated awareness of the case. This was significantly less than the same response of medical students from other years (p=0.014). Factors of gender, or being in preclinical or clinical years, were not statistically significant.

Details of response on awareness of the case, is demonstrated in Table 2. Respondents who indicated awareness of the case were also asked to indicate the source of their awareness. Of the 212 who indicated awareness, the source from which they derived awareness of the case was indicated as being - television (38.7%), internet (21.7%), newspaper (8.5%), conversations with others (6.1%) and radio (1.4%).

TABLE 2. Factors associated with level of awareness concerning the spider news.

Factors		Heard the news (%)		OR	*p*-value
		Yes	No	(95% CI)	
Gender	Male (n=257)	97(37.7%)	160(62.8%)	0.83(0.6-1.2)	NS
	Female (n=273)	115(42.1%)	158(57.9%)		
Period of Medical Year as of July 2014	Preclinical (n=212)	83(39.2%)	129(60.8%)	0.94(0.7-1.4)	NS
	Clinical (n=318)	129(40.6%)	189(59.4%)		
Year in Medical School as of July 2014	2(n=65)	19(29.2%)	46(70.8%)		0.014*
	3(n=147)	64(43.5%)	83(56.5%)		
	5(n=178)	61(34.3%)	117(65.7%)		
	6(n=140)	68(48.6%)	72(51.4%)		
	Total (n=530)	212(40.0%)	318(60.0%)		

Of the 212 respondents who indicated awareness of the case, 210 indicated their understanding of the cause of death. Of these 210 respondents, 116 (55.2%) perceived the correct message that the patient died from secondary bacterial infection, not of direct effects from spider toxins. Of the respondents who perceived the correct message, there was generally no statistical significance in regard to gender, years in medical school, being in preclinical or clinical years, or knowledge of spiders. However, on a year-by-year basis, the highest percentage of students who perceived the correct message came from year 6 (65.7%). Details concerning the number of students who correctly perceived the cause of death are shown in Table 3.

TABLE 3. Factors associated with perceiving correct message from the spider news.

Factors		Correct message (%)		OR	*p*-value
		Yes	No	(95% CI)	
Gender	Male (n=96)	57(59.4%)	39(40.6%)	1.36(0.79-2.36)	NS
	Female (n=114)	59(51.8%)	55(48.2%)		
Period in Medical Year as of July 2014	Preclinical (n=82)	40(48.8%)	42(51.2%)	0.65(0.37-1.14)	NS
	Clinical (n=128)	76(59.4%)	52(40.6%)		
Year in Medical School	2(n=19)	6(31.6%)	13(68.4%)		NS (0.058)
	3(n=63)	34(54.0%)	29(46.0%)		
	5(n=61)	32 (52.5%)	29(47.5%)		
	6(n=67)	44(65.7%)	23(34.3%)		
	Total (n=210)	116(55.2%)	94(44.8%)		
Recalled about spider lesson	Yes(n=34)	19(55.9%)	15(44.1%)	0.95(0.45-1.99)	NS
	No(n=166)	95(57.2%)	71(42.8%)		
	Total (n=200)	114(57%)	86(43%)		

The questionnaire also asked students to recall whether they had received a lesson in their medical studies in regard to spiders, prior to the questionnaire being distributed. While all students had received at least one lesson on spiders, only 61 (12.1%) of all 504 respondents indicated they had received this lesson. From students in year 2, only 1 of 63 respondents (1.6%) indicated they had received this lesson. This was significantly less than respondents from other medical years (p=0.02). Figures pertaining to the percentage of respondents who indicated that they had received prior lesson(s) about spiders are demonstrated in Table 4.

TABLE 4. Number of medical students who recalled that they had lesson about spiders.

Year in July 2014		Yes (%)	Total students answered	*p*-value
Period in Medical Year	Pre-clinical years	28(14.0%)	200	NS
	Clinical years	33(10.9%)	304	
Year in Medical School	2	1(1.6%)	63	0.02*
	3	27(19.7%)	137	
	5	16(9.6%)	167	
	6	17(12.4%)	137	
Total		61(12.1%)	504	

DISCUSSION

All Thai medical schools including the Faculty of Medicine Siriraj Hospital use a 6-year curriculum. During the first three years (preclinical years), medical students learn about basic science and knowledge as a foundation for clinical study in the last three years (clinical years). Medical students learn clinical skills and work in clinical clerkship during their clinical years. This study includes medical students who were in their 2nd, 3rd, 5th and 6th year of study in July 2014, when the spider incident took place. It represents input from medical students from both preclinical and clinical years, with an almost equal number of male and female students (51.7% and 48.3% respectively). It also reveals some interesting aspects of medical students across different years.

This study demonstrated that 2nd year medical students were less aware of the spider incident than their peers in higher years. Second year students at Siriraj Hospital have to cope with two main factors. Firstly, their studies at Siriraj Hospital commence from second year, having completed their first year in Salaya campus, Mahidol University. The living conditions and general environment for students at Siriraj Hospital are significantly different to first year conditions. The other primary factor they are dealing with is the complexity of curriculum material increases significantly from first to second year. Second year students typically have to adapt themselves quickly to their new environment, and to extensive lectures and laboratory work. They are under the burden of their studies, so they may have less time available for non-essential activities.

Our study did not evaluate the cause of less awareness of the spider news in medical students. However, there were a number of studies which determined different aspects of medical students in various years such as depression and levels of stress. A study by Dyrbye and associates showed that depression and at-risk alcohol use were highest in the early years of medical school, and were reduced in later years of medical school.[6] While this generally concurs with the proposition that second year students are under particularly high pressure, overall, various other factors would also play a role. These include factors such as school setting and curriculum. Saipanish reported a study on stress of medical students evaluated by Thai Stress Test (TST) in Faculty of Medicine, Ramathibodi Hospital, Mahidol University. The results showed levels of students who considered themselves stressed, across a year-by-year basis. In general, reported stress levels were higher in lower years, and dropped off in the mid to later years. As reported, the levels were 1st year (53.2%), 2nd year (65.0%), 3rd year (76.5%), 4th year (69.5%), 5th year (59.3%) and 6th year (47.1%).[7] Medical students from Faculty of Medicine, Ramathibodi Hospital undertake their first year studies at Salaya campus, Mahidol University. In this regard, the second year students at Ramathibodi Hospital are subject to similar challenges as second year students at Siriraj Hospital. In contrast to the two preceding papers, Ngamthipwattana and associates reported that only 17.8 percent of third year medical students in Faculty of Medicine Siriraj Hospital reported being under elevated stress levels, as evaluated by Thai Stress Test.[8]

Although there was fear amongst the general public, and rumor within the media, that the patient involved in the case died of direct effects from spider toxin, photos of necrotizing fasciitis with compartment syndrome of this patient, and evidence of confirmed bacterial infection were reported. The cause of death due to secondary bacterial infection was emphasized, and there were numerous public releases from relevant experts, including one of the authors (TJ), presented in newspapers, television, Internet and radio. Brown recluse spiders were not reported in Thailand at the time of the incident. It was not until 2 years after the incident that Brown recluse spiders were discovered for the first time in Thailand. Their existence was found to be limited to a cave in Kanchanaburi.[9] Furthermore, skin infection from Brown recluse spider bite is known to develop slowly. It may take weeks or months to exhibit severe skin lesions.[10] Our study showed that gender, year in medical school, and self-report of prior lesson about spiders contributed no significant difference on the percentage of medical students who understood correctly that the patient died of bacterial infection. However, 6th year medical students tended to receive the correct message (65.7%) more than students from other years, in particular 2nd year students (31.6%).

At the time this study was performed, all participants had previously attended a lecture on animal toxins, which provided information regarding spiders and other important poisonous animals in Thailand. The lesson had been provided during their 3rd year. Interestingly, only 12% of participants correctly indicated they had prior learning about spiders. Only 1 of 63 respondents (1.6%) who were in 2nd year when the news was released, indicated to have had a prior lesson about spiders. These 65 medical students were in 3rd year at the time of the questionnaire, and had received the lecture regarding spiders. They were in 2nd year when the news was reported. This level of incorrect response was significantly lower than students in other years. This shows that medical teachers need to develop curriculum and effective teaching methods that help students to remember and apply lessons to their clinical practice.

This study had some limitations. Firstly, it did not include 1st year and 4th year medical students, given that the authors used paper based questionnaire to control duplicated response. However, the study included two thirds of all classes, and had input from both preclinical and clinical years. Secondly, this was a single center study from one medical school in Bangkok. Students from different medical schools may respond differently. Further study should follow to include students from all medical years in multiple centers. Finally, this study was performed at one year after the event. Some students who were not aware of the event may have chosen not to respond. Also, there may be students who were aware of the event, but subsequently forgot, which may lead to an underestimate of the number aware of the event. However, given this news was reported every day in most media for 3 weeks and gained tremendous interest from both the general public and healthcare professionals, it is unlikely that a medical student would have forgotten the event.

This study has important strengths. Not only does it measure the number of students aware of the event, it also determines whether students had perceived the correct cause of death of the patient involved. To correctly perceive the cause of death would have required medical students' knowledge, application and consideration to the content presented by different sources of media.

CONCLUSION

Most medical students in this study, especially 2nd year students, missed the news that was reported extensively in media for 3 weeks. A significant number of medical students did not perceive the correct cause of death of the patient from the news. Most students did not remember that they had prior lessons regarding spiders, even though all of them had received at least one lesson in 3rd year. The medical curriculum should be designed to help medical students have more time to learn about news and activities outside the curriculum that are relevant for success in clinical practice and life skills. Some lessons should be designed to link significant cases studies published in the news or media and provide active discussions on the content and the application of their medical knowledge to such situations. Further study should be carried out to evaluate the level of awareness amongst medical students from different institutes, to give broader insight of the whole country. Also, it is interesting to evaluate how the general public perceived the news of this event, as sometimes public fear has more impact than the threat itself. Medical professionals have to deal with both the medical condition and the public response. Hence, medical students as well as other healthcare professionals should be aware of relevant news events and the surrounding issues.

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Conflict of Interest Notification Page

Authors have no conflict of interest for disclosure.

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