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ORIGINAL ARTICLE

Association Between Assessment And Missed Pain Treatment Among Patients With Headache Pain Presenting To The Emergency Department

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ABSTRACT

Pain assessment and management has been widely practiced in emergency departments all over the world. As proper pain management is directly related to improvement in patient satisfaction, health care officers have to be effective in dealing with pain related chief complaints daily. A common chief complaint of patients presenting to the emergency departments all over the world including Malaysia is headache. The aim of this study is to determine the missed pain assessment and management of headache at the Emergency Department (ED) in Hospital Universiti Sains Malaysia and the factors that were influencing them. The factors associated with missed pain assessment and treatment among patients with headache presenting to the emergency department were investigated. A cross sectional retrospective observational study was performed from December 2017 to May 2018 among all patients presenting with headache to the emergency department of Hospital University Sains Malaysia (HUSM). A total of 94 patients were enrolled in this study and 77 patients met the inclusion criteria. There was a statistically significant association (p-value<0.05) between pain reassessment and triage zone (x^2 =6.858) and patient's arrival time (x^2 =5.773). A significant association (p-value<0.05) between missed pain treatment and triage zone, and patient's arrival time was noted. The chi square value (x^2) for triage zone and patient arrival were 7.428 and 4.807 respectively. Whereas, there was no significant association between pain treatment and attending physician. Triage zone and arrival time of patients are the factors influencing missed assessment and management of pain among patients with headache presenting to ED. A proper action plan

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and more intervention studies are warranted in order to overcome the above mentioned issues and optimize pain management for headache.

INTRODUCTION

Pain assessment and management has been widely practiced in emergency departments all over the world. As proper pain management is directly related to improvement in patient satisfaction, health care officers have to effectively deal with pain related chief complaints daily[1,2.] In Malaysia, almost all tertiary hospitals have the capabilities to provide acute pain management. This includes vital signs monitoring as pain is regarded as the 5th vital sign. Pain scoring is a quantitative procedure of pain assessment done by various systems including the numerical scale[3,4]. The numerical pain scoring system provides sufficient power to score pain among patients and has been used as an assessment for pain[5]. The numerical pain scoring system is easy to use and is a standardized format to assess pain in patients. The numerical pain scoring system is also preferred by patients of varying demographic data[6,7]. Thus it is important to assess the pain score as well as initiate management of pain early and as safely as possible[8].

The World Health organization (WHO) has prepared a pain relief ladder for adults and a face scale for pediatric population which provides a guide to the management of acute and chronic pain[9]. Studies were carried out to assess cut point of pain and the results showed that different pain intensities on the numerical scale can be used as an input to classify pain as mild, moderate and severe. That being mentioned, pain score of less than 4 is of mild pain, 4 to 7 is moderate and 7 above is severe[10].

Although the usefulness of the WHO pain ladder has been questioned, studies have shown that it is still a useful tool to assess and treat pain adequately[11]. Among the many types of pain experienced by patients presenting to the ED, some of the most notorious causes of pain can be related to cancer pain. However, in the WHO guidelines produced, it also tackles cancer pain efficiently. Thus, if cancer pain can be managed effectively using these guidelines, then it is definitely a good clinical tool in the ED[12].

In Malaysia, the pain free hospital initiative has begun and it follows the international recommendations. The Pain-Free Hospital Project was initiated in 2003 with the aim of improving pain management and Malaysia has followed suit[13]. Unfortunately, patients are still unsatisfied with the level of pain treatment in the ED, although there are resources available include the numerical pain scale, medications and trained health care officers[14]. The lack of optimized pain control in patients presenting with acute pain is also observed globally even with all the advances in the ED,[15]

There has been increasing demand by patients in the casualty for better pain treatment. In the era of the internet, the patients can educate themselves and their rights to pain care and its standards. Social media allows patients to compare their experiences visiting the

casualty for pain and its impact on their lives[16]. Therefore, in today's world we have to be very vigilant and ensure that patients presenting with a chief complaint of pain in the ED gets assessed correctly and treated early to optimize patient's condition, experience and satisfaction in the ED.

Many factors affect pain management and assessment. A study among the pediatric population showed that patients age, geographic location and volume of patients attending the emergency department were all factors in the outcome of pain management in the emergency[17]. One study revealed that 90 percent of patients studied reported pain of moderate to severe scores[18]. Understanding the level of assessment and management of patients presenting with headache to the ED is crucial.

A common complaint of patients presenting to the ED all over the world including Malaysia is headache[19]. Not only is headache common in the ED, it also accounts for many visits to the outpatient departments around the world, which may indicate benign or malignant underlying disorders[20]. A majority of the patients presenting to the ED and outpatient departments have a benign cause of headache, however a physician should be aware of secondary causes of headache and more sinister complications such as sub arachnoid haemorrhage which may be life threatening[5]. Therefore, proper assessment and treatment of pain can help physicians be aware of the progression of illness and improve the care of patients presenting to ED[21]

The aim of this study is to determine the assessment and management of headache pain at the ED in Hospital Universiti Sains Malaysia. The factors associated with missed pain assessment and treatment among patients with headache presenting to the ED were investigated.

Retrospective review of the emergency case notes was carried out to determine if pain assessment and scoring was done, the usage of analgesia and the reassessment of pain scores post analgesia. These emergency case notes were reviewed once the patients were discharged or transferred out from the emergency department.

METHOD

Study Design

A cross sectional retrospective observational study was performed from December 2017 to May 2018 among all patients with headache (primary headache, secondary headache and headache related to other illness) presenting to the emergency department of Hospital University Sains Malaysia (HUSM). Prior to data collection, an ethical approval was obtained from University Ethical and Research Committee, HUSM. The confidentiality of the data was ensured. Consent was also obtained from the dean's office to view the case notes of patients.

Study Population

All the patients presenting with headache pain (primary headache, secondary headache and headache related to other illness) to ED HUSM during the study period were assessed in the study by the emergency department doctors during their shifts. Patients were identified using symptoms of headache as one of their complaints at the triage counter. Inclusion criteria include all patients presenting with headache as the chief complaint, associated complaint or as an additional symptom. Patients who have known allergies to pain medication and patients who refuse for pain treatment are excluded from the study. The sample size calculation was done using the single proportion sample size calculation. This calculation will help us receive a sample size that reflects the required precision and confidence for a population size of 4000. Therefore, the sample size needed was 94 patients with an error rate of 9.9% and a confidence level of 95%.

Study Procedures

A retrospective cross-sectional observational study was conducted. As the patients presents with headache type of pain to the ED either as a main complaint or associated complaint, (including primary headache, secondary headache or headache associated with other illness), the triage officer informs the researcher. The researcher then sees and confirms the presence of headache in the patient which requires treatment and analgesia. Only then the patient is recruited into the study. The patient is then allowed to go through the treatment flow in respective zones in the ED and they were seen by the doctors as per usual practice. After the patients have undergone their treatments and have been either admitted or discharged, the researcher looks at the emergency case notes and collects the data from the case notes on whether the pain was scored, treated and reassessed.

The proforma used in this study included information such as triage zone that the patient was consulted, patient's arrival time to ED, attending physician, diagnosis, pain scoring, type of pain treatment (pharmacological or non-pharmacological) and pain reevaluation before discharge. Using the proforma and the patient's case notes, the data of missed pain assessment and treatment were obtained for each patient.

To define missed pain assessment, the pain score will be studied, to define missed pain treatment the delivery of analgesia will be studied and to define reassessment of pain, the patients emergency case notes will be seen for any documentation on reassessment of pain prior to patient being discharged from the ED or admitted to the ward.

Definition of operational terms used in this study

a) Missed pain assessment – missed pain assessment is when there is no pain scoring documented for headache in the patient's case notes during the initial encounter in the emergency department.
b) Missed pain treatment – missed pain treatment is when there is no pain killer given to the patient for headache during the initial encounter in the emergency department
c) Missed pain reassessment – missed pain reassessment is when there is no documentation on reassessment of the headache pain prior to disposition of the patient from the emergency department whether admitted to the ward or prior to discharge

Data Analysis

All data entries and statistical analysis were done using IBM SPSS version 23. The data went through a cleaning process which means detecting incomplete data which was missing or not recorded (e.g., comorbidities), removing incomplete data, and ensuring consistency (e.g. traumatic and non-traumatic causes) before further analysis was done. The data was screened for any wrong entry, duplication and missing values. Missing values were properly declared in SPSS data entry.

Descriptive analysis was done on demographic background of the patients and on each associated factor for the study. Frequency and percentage were reported for categorical variables, while mean and standard deviation (SD) were reported for normally distributed numerical variables. Median and interquartile range (IQR) were reported for non-normally distributed numerical variables.

Bivariate analysis using Pearson Chi square test was carried out to determine the factors associated with missed pain assessment and treatment in emergency department as it is a suitable test tool to find association between categorical variables of independent samples. Assumptions of expected frequency was checked while doing the analysis. If the p value is less than 0.05, the association was considered as statistically significant.

RESULTS

The results in this study used non-traumatic causes of headache. The reason for the use of either traumatic or non-traumatic causes of headache is that previous studies did not combine traumatic and non-traumatic headache.

The results were interpreted for all non-traumatic headaches (primary headache, secondary headache and headache associated with other illness) because headache in the emergency department can present in a spectrum of presentations, diverse with varying

types associated with other illnesses, and that some secondary headaches can be understood as variations of primary headache. The headache pain is still treated together with the underlying cause in secondary headaches and headaches related to other illness as a holistic approach.

Demography

Statistical analysis was performed with IBM SPSS Statistics 25.0. Table 1 presents the descriptive analysis of sociodemographic data and presentation of headache pain in non-trauma cases in Emergency Department. Normality of continuous variables was determined using Kolmogorov-Smirnov test. The distributions of age and weight were not normal and presented as median and interquartile range (IQR). The median age of the patients was 34 (IQR=32), while the median body weight was 60 (IQR=10). Categorical variables were presented as frequencies and percentages. Majority of the patients were Malaysians (99.7%) and only 3 patients were non-citizens (1.3%)

Table 1: Descriptive analysis on sociodemographic data and presentation of headache pain in non-trauma cases in Emergency Department (n = 77)

Variable	Frequency (%)
Age (years) [a]	34 (32)
Weight (kg)[a]	60 (10)
Nationality	
Non Malaysian	1 (1.3)
Malaysian	76 (99.7)
Gender	
Female	29 (37.7)
Male	48 (62.3)
Referred case	
No	68 (88.3)
Yes	9 (11.7)
Triage zone	
Green	35 (45.5)
Yellow	30 (39.0)
Red	12 (15.6)
Attending physician	
MO	31 (40.3)
HO	45 (58.4)
Specialist	1 (1.3)
Prior Analgesia (n = 75)	
No	61 (81.3)
Yes	14 (18.7)
Arrival time (n = 75)	
Day	59 (78.7)
Night	16 (21.3)

[a] Median (IQR)

Factors associated with missed pain scoring, treatment and reassessment.

The results of Chi-square test for pain scoring, pain treatment, and pain reassessment are presented in table 2, table 3 and table 4 respectively. Triage zone and arrival time of patients were the factors that influenced missed pain treatment and reassessment.

Pain Scoring

Table 2 presents the association between factors and missed pain scoring done among headache pain in non-trauma cases presenting to the Emergency Department. Pearson chi square test was conducted when there have less than 20% of the cells with observed value of 5. In case the assumption was not fulfilled, Fisher's Exact test was performed. There was

no sufficient evidence of significant association between attending physician, triage zone and arrival time of patients with missed pain scoring. There was no sufficient evidence of significant association between attending physician and the conduct of pain scoring (p=0.427).

Table 2: Association between factors and pain scoring among headache pain in non-trauma cases presenting to the Emergency Department

Factors		**Pain scoring**		**Test statistics**	***P***
		Yes n (%)	**No n (%)**		
Attending physician	MO	9 (40.9)	22 (40.0)	2.336	0.427
	HO	12 (54.5)	33 (60.0)		
	Specialist	1 (4.5)	0 (0.0)		
Triage zone	Green	9 (40.9)	26 (47.3)	1.937	0.380
	Yellow	11 (50.0)	19 (34.5)		
	Red	2 (9.1)	10 (18.2)		
Arrival time	Day	13 (61.9)	46 (85.2)	4.883	0.056
	Night	8 (38.1)	8 (14.8)		

[a] Pearson chi-square test; [b] Fisher's Exact test
*significant at p<0.05

Pain Treatment

Table 3 presents the association between factors and missed pain treatment among headache pain in non-trauma cases presenting to the Emergency Department. Pearson chi square test was conducted when there are less than 20% of the cells with observed value of 5. In case the assumption was not fulfilled, Fisher's Exact test was performed. There was sufficient evidence of significant association between arrival time of patient and triage zone with missed pain treatment. There was no sufficient evidence of significant association between attending physician and missed pain treatment (p=0.247).

Table 3: Association between factors and missed pain treatment among headache pain in non-trauma cases presenting to the Emergency Department

Factors		**Pain treatment**		**Test statistics**	***P***
		Missed n (%)	**Not missed n (%)**		
Attending physician[b]	MO	19 (37.3)	12 (46.2)	2.652	0.247
	HO	32 (62.7)	13 (50.0)		
	Specialist	0 (0.0)	1 (3.8)		
Triage zone[a]	Green	25 (49.0)	10 (38.5)	7.428	0.024*
	Yellow	15 (29.4)	15 (57.7)		
	Red	11 (21.6)	1 (3.8)		
Arrival time[a]	Day	43 (86.)	16 (64.0)	4.807	0.028*
	Night	7 (14.0)	9 (36.0)		

[a] Pearson chi-square test; [b] Fisher's Exact test
*significant at p<0.05

Pain Reassessment

The data for pain reassessment is collected from the emergency case notes before the patient is discharged or admitted to the ward. The emergency case notes are looked at whether there was any documentation to indicate reassessment of patient's pain. That is considered as pain reassessment and it is documented in the data collection sheet.

Table 4 presents the association between factors and pain reassessment among headache pain in non-trauma cases presenting to the Emergency Department. Pearson chi square test was conducted when there are less than 20% of the cells with observed value of 5. In case the assumption was not fulfilled, Fisher's Exact test was performed. There was sufficient evidence of significant association between triage zone and arrival time of patients with

missed pain reassessment. There was no sufficient evidence of significant association between attending physician and missed pain reassessment (p=0.220).

Table 4: Association between factors and pain reassesment among headache pain in non-trauma cases presenting to the Emergency Department

Factors		Pain reassessment		Test statistics	*P*
		Yes n (%)	No n (%)		
Attending physician[b]	MO	5 (38.5)	26 (40.6)	3.697	0.220
	HO	7 (53.8)	38 (59.4)		
	Specialist	1 (7.7)	0 (0.0)		
Triage zone[a]	Green	4 (30.8)	31 (48.4)	6.858	0.032*
	Yellow	9 (69.2)	21 (32.8)		
	Red	0 (0.0)	12 (18.8)		
Arrival time[b]	Day	7 (53.8)	52 (83.9)	5.773	0.026*
	Night	6 (46.2)	10 (16.1)		

[a] Pearson chi-square test; [b] Fisher's Exact test
*significant at p<0.05

DISCUSSION

Headache is a common presentation to the emergency department similar to other countries worldwide including the United States of America. Headache should ideally be managed according to the WHO pain guidelines[22]. A proper assessment and treatment of headache pain is crucial in patient satisfaction. In addition, the current policy of Ministry of Health Malaysia recognizes pain as the 5th vital sign. The objective of this study was to review the assessment headache and its management at the emergency department. Pain score scales such as the numeric scale for adults and face scale for pediatric patients and a variety of analgesics is readily available at the emergency department.[23]

In our study, the attending doctor, triage zone and patient's arrival time are considered factors associated with missed pain assessment and treatment because they had reasonable level of involvement in patient care, these factors are manageable among others, they are likely to be important in implementing practices in pain management and the ability of these factors to be replicated in the future.

Triage zone is a factor in pain treatment and pain reassessment. This could be due to the large number of patients during day time in the green zone and small doctor to patient

ratio[24]. Overcrowding and congestion are common issues in the green zone and is reported by many studies[25]. Therefore, proper actions and strategy need to be taken to improve patient flow in order to optimize patient management particularly headache pain as demonstrated in this study.

The results of this study show that among all the attending physician, missed pain treatment and pain reassessment were highest among the house officers (HO). This could be due to lack of experience and exposure in pain management. Poor level of knowledge about pain among patients and poor communication between officers and the patient are the reasons why patients report experiencing pain even after adequate assessment and treatment is given[26]. Education on pain assessment is crucial to health care officers as they are dealing with conditions related to pain daily. Being the first to encounter patients, their knowledge in managing pain is crucial to ensure patient comfort and satisfaction[27]. Having an assessment of the way patients with pain are treated in the casualty will ensure physicians have a good understanding about the way pain is treated. Physician-patient communication is a main factor in patient dissatisfaction.

Most emergency medicine centres are overcrowded and manned with health care workers needing to operate in extended shifts. These health care workers provide pain management services for a very large number of patients who visit the emergency daily, hence they are unable to conduct the assessment and management of pain in great depth[28]. Proper pain management can improve the patients experience when visiting the emergency department. However, proper assessment and management needs to be instilled from the point patient walks into the doors of the emergency department to ensure good quality care.

CONCLUSION

This study revealed that pain assessment and management of headache type of pain is done in the emergency setting but it is still inadequate because majority of the patients presenting with headache did not receive analgesia, had missed pain scoring and missed pain reassessment. Factors that were associated with missed pain treatment among patients presenting with headache pain to the emergency department were triage zone and arrival during the daytime. Proper action and more intervention studies are warranted in order to overcome above mentioned issues and to optimize pain management for headache pain. The present study gave a better understanding on the level of assessment and management of headache pain at the emergency department so that we can find out exactly where we stand in delivering optimal pain control to patients as early as possible to ensure a pain friendly emergency department.

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