ASSOCIATION BETWEEN ASSESMENT AND MISSED PAIN TREATMENT AMONG PATIENTS WITH HEADACHE PAIN PRESENTING TO THE EMERGENCY DEPARTMENT

DR GURJEET SINGH

DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF MEDICINE (EMERGENCY MEDICINE)

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LIST OF ABBREVIATIONS

MO:	Medical Officer
HO:	Houseman Officer
ED:	Emergency Department
HUSM:	Hospital Universiti Sains Malaysia
SD:	Standard Deviation
IQR:	Interquartile Range

KAITAN ANTARA PENILAIAN DAN RAWATAN SAKIT KEPALA YANG DIABAIKAN BAGI PESAKIT-PESAKIT YANG MENGUNJUNGI JABATAN KECEMASAN

ABSTRAK

LATAR BELAKANG

Penilaian dan pengurusan kesakitan telah diamalkan secara meluas di jabatan kecemasan. Pegawai perubatan perlu mengendalikan aduan utama harian tentang kesakitan pesakit secara efektif kerana pengurusan kesakitan yang wajar mampu meningkatkan kepuasan pesakit terhadap rawatan yang diberi. Di seluruh dunia termasuk Malaysia, sakit kepala adalah antara aduan utama pesakit yang mengunjungi jabatan kecemasan. Oleh yang demikian, kajian ini bertujuan untuk menentukan pengurusan yang tidak dikendalikan bagi pesakit sakit kepala di jabatan kecemasan Hospital Universiti Sains Malaysia.

KAEDAH

Faktor-faktor yang berkaitan dengan penilaian dan rawatan yang tidak dikendalikan bagi pesakit-pesakit tersebut telah dikaji. Kajian keratan rentas secara retrospektif telah dijalankan dari Disember 2017 hingga Mei 2018. Sebanyak 94 pesakit terlibat dalam kajian ini manakala hanya 77 pesakit sahaja mematuhi kriteria kemasukan.

KEPUTUSAN

Secara statistik, perkaitan yang signifikan dilaporkan antara pengurusan kesakitan berulang dan zon triaj (x^2 =6.858) dan waktu ketibaan pesakit di jabatan kecemasan (x^2 =5.773). Perkaitan yang signifikan juga dicatatkan antara rawatan yang tidak dikendalikan dan zon

triaj dan waktu ketibaan pesakit di jabatan kecemasan. Manakala, tiada perkaitan yang signifikan dicatatkan di antara rawatan kesakitan dan pakar perubatan bertugas.

KESIMPULAN

Zon triaj dan waktu ketibaan pesakit di jabatan kecemasan adalah faktor-faktor yang menyumbang kepada pengurusan kesakitan yang tidak dikendalikan bagi pesakit di jabatan kecemasan. Tindakan dan campur tangan yang wajar diperlukan bagi mengatasi isu-isu yang dinyatakan dan mengoptimumkan pengurusan kesakitan bagi pesakit sakit kepala.

KATA KUNCI

Sakit kepala, penilaian, pengurusan, factor, penilaian kesakitan, pengurusan kesakitan

ASSOCIATION BETWEEN ASSESSMENT AND MISSED PAIN TREATMENT AMONG PATIENTS WITH HEADACHE PAIN PRESENTING TO THE EMERGENCY DEPARTMENT

ABSTRACT

Background

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 effectively dealt 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 in this study is to analyze the assessment and management of headache pain at the emergency department in Hospital Universiti Sains Malaysia and the factors that were influencing them.

Methods

The factors associated with missed pain assessment and treatment among patients with headache pain presenting to the emergency department were investigated. A cross sectional retrospective observational study was performed from December 2017 to May 2018 among all patients with headache presenting 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 inclusive criteria.

Results

There was a statistically significant association (p-value<0.05) between pain reassessment and also the triage zone (x^2 =6.858) and patient's arrival time (x^2 =5.773). Together with that a significant association (p-value<0.05) between missed pain treatment and triage zone, and patient's arrival time was identified. The chi square value (x^2) for triage zone and patient arrival were 7.428 and 4.807 each. Whereas, there was no significant association between pain treatment and attending physician

Conclusion

Triage zone and arrival time of patients are the factors influencing miss assessment and management of pain among patients with headache presenting to ED. A proper action and more intervention studies are warranted in order to overcome above mentioned issues and optimize pain management for headache pain.

Keyword

Headache, assessment, management, factors, missed, pain treatment, pain reassessment

SECTION 1

1. INTRODUCTION

1.1. Background of the Study

Pain assessment and management has been widely practised by the health care staff in emergency departments all over the world including Malaysia. The health care officers have to effectively deal with pain related chief complaints daily (Campbell, Dennie et al.2004) The term headache pain has been used in relation to its variety of types, presentations and treatment options.(Keller and Bzdek 1986) The term headache pain has also been used for assessment of the quality of a type of headache pain (Hunter and Philips 1981) The diagnosis or identification of headache is done by using the chief complaint and related complaints together with clinical factors(Morgenstern, Huber et al. 2001). This process is routinely done in the emergency department. Proper pain management is directly related to improvement in patient satisfaction (Caristi, Miotto et al. 2006) In Malaysia, almost all tertiary hospitals have the capabilities to provide acute pain management. This includes vital signs monitoring because nowadays pain is regarded as the 5^{th} vital sign. Thus it is also the duty of the health care officer to assess pain score and also to initiate management of pain as soon as possible and as safely as possible. (Flaherty 2001)Acute pain may occur within any discipline in the medical field such as medicine, surgery, obstetrics and orthopaedics among others. Even with all the advances in the emergency medicine department we still see a lack of optimized pain control in patients presenting with acute pain. (Cordell, Keene et al 2002)

There has been increasing demand of better pain treatment visiting the casualty. As the internet era approaches us the patients can educate themselves and their rights to pain care and its standards. The patients can compare among themselves with the development of social media regarding their experience visiting the casualty for pain and its impact on their lives.(McMullan 2006)

Therefore, in today's world we have to be very vigilant and ensure that patients presenting with a chief complaint of pain in the emergency department gets assessed correctly and treated early to optimize patient's condition, experience and satisfaction in the emergency departments. Having an assessment of the way patients are treated with pain in the casualty will ensure we have a good understanding about the way pain is treated at its very first encounter. As most of emergency medicine heath care workers operate in shifts, covering 24 hours of pain service and with a very large number of patients visits the emergency daily for pain, we are able to understand about the assessment and management of pain in a greater depth.

A common complaint of patients presenting to the emergency departments all over the world including Malaysia is headache. Almost half of the number of patients presenting to the emergency department with headache have some form of neurologic disorder. Not only is headache a common in the emergency department, it also accounts of many visits to the outpatient departments around the world, which may carry benign or malignant underlying disorder.(Kuruvilla and Lipton 2015)

There are many types of headaches and its varied presentations to the emergency departments. Types of headaches can be for example tension, psychotogenic, stress, ordinary,

essential, idiopathic among many others. Emergency departments also see trauma cases and traumatic causes of headache is also a significant cause of headaches in the emergency setting(Brenner, Friedman et al. 1944)

Management of headache is complex. It involves the use of many pharmacologic agents which are not readily available in the emergency setting for example ergotamine. However, there has been roles of readily available medications that can be given in the emergency setting for patients such as NSAIDS and also the reserved use of opioids though less evident but mentioned in the treatment of headaches(Snow, Weiss et al. 2002) The WHO pain ladder has the roles of NSAIDS and opioids in its management and thus could be used to treat patients with headache type of pain in the emergency.

A majority of the patients presenting to the emergency departments and outpatient departments have a benign cause of headache, however as physicians we should be aware that among these percentage of patients visiting the emergency department, secondary causes of headache and more sinister complications such as sub arachnoid haemorrhage is a known cause and could be life threatening.(Edlow and Caplan 2000). A good assessment and treatment of pain can help us be aware of more dangerous pathology in the patients presenting to us.

The aim in this study is to determine the assessment and management of headache pain at the emergency department in Hospital Universiti Sains Malaysia

1.2. Justification of the Study

Headache is a common presentation to the emergency department and we have to deal with the complaint of headache well. Headache causes pain to the patient and thus it has to be managed through the pain guidelines. A proper assessment and treatment of headache pain is crucial in-patient satisfaction and treatment of the 5^{th} vital sign in the emergency department.

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 is ensuring patient comfort and satisfaction.

Proper pain management can improve the patients experience when visiting the emergency department. However, proper assessment and management needs to be instilled as the patient walks into the doors of the emergency department to ensure good quality care.

This study is targeted on observing the assessment of pain and its management at the emergency department. The tools for assessing the severity of pain and the medications for relieving pain based on the pain score is readily available at the emergency department.

The pain assessment will be done by looking into the emergency case notes of patients to check if pain was scored, pain treatment would be checked if any form of analgesia is given to the patient via the emergency case notes and pain reassessment would be done by looking into the emergency case notes if any documentation of patients pain progression after analgesia was given. The emergency case notes will be studied when the patient has

completed the management in the emergency department before being admitted or discharged.

It is hoped that this study will give us 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.

1.3. Research Questions

- Is the assessment of headache pain done at the Emergency Department of HUSM?
- Is pain treatment applied to patients presenting with headache pain to the Emergency Department of HUSM?
- Is the response to treatment evaluated after prescription of analgesia?
- Are there any factors associated with missed headache pain assessment and management?

1.4. Objectives

1.4.1. General objectives

To study on the assessment and management of headache at the Emergency department of HUSM.

1.4.2. Specific objective

- To study the sociodemographic data and presentation of headache pattern in the emergency department
- To study on headache scoring, treatment and reassessment in the emergency department
- To study on factors associated with missed pain scoring, treatment and reassessment among headache presenting to the emergency department

1.5. Hypothesis

- Headache pain assessment is performed at the emergency department.
- Treatment for headache pain is performed at the triage counter
- Headache pain is reassessed after treatment is given.
- Factors such as demographics is a factor for missed headache pain assessment and treatment

1.6. Literature Review

Headache is a relatively common presentation to the emergency departments worldwide and its epidemiology has been studied in which the diagnosis of headache is made based on a structured history taking and physical examination based on organizations. There are different types of headaches that were studied and many factors were associated example, migraine, tension type of headache being the common ones and others that included trauma or disorders related to medications hormones and work(Rasmussen 1995)

Various types of headaches present to the emergency department. Some of the most studied ones include tension type headache in which its lack of assessment and proper management can lead to reduced productivity(Crystal and Robbins 2010). Another type of headache commonly encountered or studied upon is cluster headache, in which a history taking and examination which shows its clinical pattern makes the diagnosis. A few of the patients fall into the chronic cluster headache category which can be avoided if a proper assessment and management is done. Traumatic headaches are types of headaches that present to the emergency departments as well. A natural history taking and physical examination looking for its characteristics can help to diagnose traumatic headaches in which whiplash headache is one of the types. Traumatic headaches can present in a whole spectrum and early treatment and recognition has shown rapid improvement whereas others can go on to have chronic disabilities thus the importance of a good assessment and management

Headache is also prevalent in the pediatric population as well as adults. School going children were able to give a reliable history on pain(Saps, Seshadri et al. 2009) In children who were unable to give a history, history from the parents were accurate and just as important . The face pain scale using facial expression in pre-school going children to score and treat pain is currently used in the emergency setting to address pain in children and help in assessment and management of pain in children(Tomlinson, von Baeyer et al. 2010)

Pain assessment refers to the pain scoring done by various systems including the numerical scale. The numerical pain scoring system provides sufficient power to score pain among patients. 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. (Hjermstad, Fayers et al. 2011)

Unfortunately, patients are still unsatisfied with the level of pain treatment in the emergency department, even though the numerical pain scale and medications are available with trained health care officers. Pain free hospital initiative has started in Malaysia and it follows the international recommendation. The Pain-Free Hospital Project was initiated in 2003 with the aim of improving pain management and Malaysia has followed suit.(Maier, Nestler et al. 2010)

Many factors affect the pain management and assessment. A study was done among the pediatric population showed patients age, geographic location, volume of patients attending the emergency department were all factors in the outcome of pain management in the emergency. In another study it was noted that pain scoring that was done in male and female patients showed 90 percent of the scoring was of moderate to severe scores.(Baharuddin, Mohamad et al. 2010)

There are many methods that has been described to treat headache type of pain which has a multidisciplinary approach and also poses the risks of overuse medications. There need to be roles of physiotherapist, cognitive behavioral therapist, headache nurses to effectively treat headache however there is still lacking data on the efficacy of these treatments. In the emergency setting how then can these methods be applied and what would be simple yet effectively treat headaches presenting to the emergency departments. The role of Non-steroidal anti-inflammatory drugs was shown to have an early onset of action and reduced headaches presenting to the hospitals. The role of opioids analgesia has also been addressed in the treatment of headaches and its efficacy was demonstrated(Ziegler 1997) The treatment of NSAIDS and opioids and its indications of usage is well described in the WHO pain ladder and this would be a good tool to use as a guide to treatment of patients with proven efficacy.

The World Health organization (WHO) has prepared a pain relief ladder which provides a guide to the management of acute and chronic pain. These medications include NSAIDS and opioids among others to treat pain based on severity of pain.(Blondell, Azadfard et al. 2013) Based on studies done where the cut point of pain is assessed , it is showed that different pain intensity on the numerical scale can be an input to mild, moderate and severe pain. That being mentioned, pain score of less than 4 is of mild pain, 4 to 7 is moderate and 7 above is severe.

The usefulness of the WHO pain ladder has been questioned but studies have shown that it is still a useful tool to assess and treat pain adequately.(Vargas-Schaffer 2010) Among the many types of pain experienced by patients presenting o the emergency department, 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 and in a proper guide. Thus, if cancer pain can be controlled with this guideline then it is definitely a good clinical tool to use to manage the pain in the emergency department. There areas till problem with patients experiencing pain even after adequate assessment and treatment, and that problem have been divided into a few factors. They can be identified as poor level of patient knowledge about pain and also poor communication regarding pain itself with the officer and the patient.(Yates, Edwards et al. 2002).

Because of all these factors we hope that this study can shed some light on patient's management in the health care system so that we can further equip ourselves with more knowledge to treat our patient's better. We will also be able to assess the knowledge and attitude of the staff towards patients presenting with pain which is a known criteria for optimal patient management.(Simpson, Kautzman et al. 2002)

Missed data for pain scoring in the clerking sheet can be due to the busy hours of ED and is also a factor of investigation for this study. Although it is clear that the main methods of pain assessment are by using pain scales such as pain scoring which has been discussed, there have also been reports on pain assessment using other methods. Missed data scoring in the clerking sheet during the busy hours of ED can also lead to missed also a factor of investigation for this study. These methods include behavioral or psychological measures. Although self-reporting is the best, however in cases which self-reporting is not done, non-verbal methods such as facial or body language is helpful in determining pain. Nonverbal assessment of pain can be done as advised by the ministry of health module for training of paramedics. Nonverbal physiological methods such as the heart rate and blood pressure of the patients can also be used to determine pain (Zwakhalen, 2006)

Currently the mainstay of treatment for headache is via the use of analgesia. Acute drug therapy is the mode of treatment of headaches such as migraine. Analgesics and addition of other drugs is currently used for the treatment of headaches (Diener, 1994) The pathogenesis of headaches is still unclear especially primary headaches such as migraine however 5-hydroxytriptamine is known to be a key factor in the pathogenesis of headache and thus headaches are treated with pain killers in multi modalities**.**

Pain treatment should be a practice culture for all patient's pain despite the underlying cause which is part of a holistic care of patients, promotes client satisfaction, reduces psychological distress, shortens stay in the ED and is also the patients right to adequate treatment of all his/her symptoms. The patients pain symptom should be treated while primary treatment is ongoing as primary treatment can take time example hours or days to cure. Based on the MOH training module for pain as the 5^{th} vital sign, pain is assessed, treated and even reassessed based on a flow chart regardless of the underlying cause which should

also be treated together with the primary for a holistic approach. The MOH training module for paramedics on pain as the 5th vital signs also mentions using pain assessment and treatment for research and documentation as well as compiling and reporting for quality improvement.

Therefore, we hope that we can further understand the level of assessment and management of patients presenting with headache pain to the emergency department. We also believe that proper pain assessment and early pain treatment at the emergency department itself will optimize pain control in our patients in HUSM and further improve patient's satisfaction and overall experience in visiting the emergency department. Lastly, we also hope this study will initiate a headache protocol for the patients presenting with the similar complaint to the hospital.

SECTION 2

2. METHODOLOGY

2.1. Study Protocol

A cross sectional retrospective observational study was performed from December 2017 to May 2018 among all patients with headache pain (including 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, University Ethical and Research Committee, HUSM was consulted and an ethical approval was obtained and approval from the dean's office was obtained for using the data collection sheet. The confidentiality of the data was ensured. The approval letter is presented in Appendix A.

Patients were identified using symptoms of headache as one of their complaints at the triage counter. Any complaints of headache in the patient being chief complaint or associated complaint or symptoms was recruited in the study. The triage then alerts the researcher of the patient and the patient's zone of treatment in the emergency department. The researcher then sees the patient and confirms the presence of headache in the patient and need for analgesia in the patient. The patient is then allowed to continue the flow of the treatment in the emergency setting in its respective zones. The patient is seen by the attending physician (House officer or medical officer) and the completed case notes are placed on the counter in the case note collecting box. After completion of patient's treatment and before disposition of patient (discharged or admitted), the researcher checks the emergency case notes seen by

the officers and takes down the data on demographics, pain scoring, pain treatment and reassessment as in the data collection forms.

The official stamp on the case note whether it is a house officer or medical officer is the one who is primarily in charge of the patient and is regarded as the attending physician. The data for pain reassessment is collected from the case notes before the patient is discharged or admitted to the ward. The case notes are looked at whether there was any documentation checking whether the patient's pain has reduced or not. That is considered as pain reassessment and it is documented in the data collection sheet. Adults were assessed for pain using the Ministry of health pain scale and preschool going children were assessed using the face scale both assessments are a common mode of pain assessment in the emergency setting. Patients who had allergic to pain medications or did not want pain medication was excluded from the study. Data was collected from the case notes after they were seen by the doctor attending to these patients. Approval letter for using data in the case notes is presented in Appendix A. The data sheet of the patients then followed the same protocol of storage similar to other patients. The data collected was from the patient's records.

2.2. Study population

All the patients presenting with headache (including primary headache, secondary headache and headache related to other illness) to the emergency department in HUSM during the study period that fulfills the inclusion and exclusion criteria are assessed in the study. Adults were assessed using the numerical scale and preschool going children assed via face scale which is a common pain scoring tool used in the emergency setting.

The Inclusion criteria are:

- Patients presenting with headache pain (adults and pediatrics)
- Patients presenting with non-traumatic cause of headache
- All headache including primary headache, secondary headache and headache associated with other illnesses.

The exclusion criteria are:

- Patients who have known allergies to pain medication
- Patients who refuse for pain treatment

The sample size calculation was done using the single proportion sample size calculation. The formula that was used to calculate the sample size is as follows:

$$N = (z/delta)^2 \times P \times (1-P)$$

$z = 1.96$

$delta = 0.05$

$P = 0.9$

This calculation helps 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%.

2.3. Data collection

An assessment tool which consisted of assessment forms that contained the components of sociodemographic data and whether pain was assessed and treated was used

for this study which had gone through ethical approval and approval by Hospital Universiti Sains Malaysia Deans Office. Samples were taken from the patients presenting with headache to the emergency department. The triage officer would inform the researcher every time the triage sees a patient with a complaint of headache in its presentation. The researcher then checks with the patient to confirm the patient has a headache. Subsequently the patient is allowed to go to its respective zones of treatment and continue with the flow through the emergency department. After the patient has gone through the evaluation and treatment, the case note from for each patient was evaluated. Study was done by looking at the case note in every case file.

Pain reassessment is a routine variable displaying progression and quality of patient care and is mentioned in the flow chart in the Ministry of Health pain as the 5^{th} vital sign training module for paramedics despite it not being an SOP. According to the joint commission journal of patient safety and quality, pain reassessment is inconsistent and this information was collected so that we can ultimately facilitate the safety and quality of pain management in this center in the future.

Assessment was checked for the following:

- if pain assessment is done by looking for documentation on pain scoring,
- if pain treatment weather pharmacological or non-pharmacological is given and
- if pain is reevaluated before discharge.

Inclusion and exclusion criteria

Inclusion criteria:

All patients presenting with headache [adults (using the numeric scale) and pediatrics (using the face scale)]

Patients presenting with non-traumatic cause of headache.

All headaches including primary headache, secondary headache and headache related to other illnesses.

Exclusion criteria:

Patients who have known allergies to pain medication

Patients who refuse for pain treatment

2.4. Data Analysis

All data entries and statistical analysis were done using IBM SPSS version 23. The data went through cleaning process before further analysis was done which means the data was screen for any wrong entry, duplication and missing values. 94 patients were enrolled in the study and one was excluded because of missing data and another 16 was traumatic cause of headache 77 patients were studied. 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.

In order to determine the associated factors of missed pain assessment and treatment, Logistic Regression analysis was applied. Univariable analysis was done by applying Simple Logistic Regression. Variables with p-value < 0.05 and clinically importance were selected for variable selection by Multiple Logistic Regression using forward LR and backward LR method. Results from both methods were compared; parsimonious model were selected. Multicollinearity and interaction checking were done when more than 1 variables remained in the model.

To achieve final model, 3 assumptions need to check. The 3 assumptions were Hosmer-Lemeshow goodness-of-fit test, overall, correctly classified percentage and area under the ROC curve.

SECTION 3

3. MANUSCRIPT

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 effectively dealt 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 in this study is to determine the missed assessment and management of headache pain at the

emergency department 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 with headache presenting 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 miss assessment and management of pain among patients with headache pain presenting to ED. A proper action and more intervention studies are warranted in order to overcome above mentioned issues and optimize pain management for headache pain.

Keyword

Headache, assessment, management, factors, missed, pain treatment, pain reassesment

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 be 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 as soon as possible 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 intensity on the numerical scale can be an input to classify the 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 and in a proper guide. Thus, if cancer pain can be controlled with this guideline then it is definitely a good clinical tool to use to manage the pain in the ED[12].

In Malaysia, pain free hospital initiative has started and it follows the international recommendation. 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 the numerical pain scale

and medications are available with 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 of better pain treatment visiting the casualty. As the internet era approaches us the patients can educate themselves and their rights to pain care and its standards. The patients can compare among themselves with the development of social media regarding their experience 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 the pain management and assessment. A study was done among the pediatric population showed patients age, geographic location, volume of patients attending the emergency department were all factors in the outcome of pain management in the emergency[17]. In another study it was noted that pain scoring that was done in male and female patients showed 90 percent of the scoring was of moderate to severe scores[18]. Understanding the level of assessment and management of patients presenting with headache pain 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 a common in the ED, it also accounts of many visits to the outpatient departments around the world, which may carry benign or malignant underlying disorder[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 that among these percentage of patients visiting the ED, secondary causes of headache and more sinister complications such as sub arachnoid haemorrhage is a known cause and could be life

threatening[5]. Therefore, a good assessment and treatment of pain can help a physician to be aware of the progression of illness and improve the care in the patients presenting to ED[21]

The aim in 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 pain presenting to the ED were investigated.

The pain assessment will be done by looking into the emergency case notes of patients to check if pain was scored, pain treatment would be done by looking in the emergency case notes of patients if any form of analgesia is given to the patient and pain reassessment would be done by looking into the emergency case notes for any documentation of patients pain progression. The emergency case notes will be studied when the patient has completed the management in the emergency department before being admitted or discharged

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. Any complaints of headache in the patient being chief complaint or associated complaint or symptoms was recruited in the study. 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.

Assessment form that contained the components of assessment was used for the assessment which consists of component such as triage zone that the patient were consulted, patient's arrival time to ED, attending physician, diagnosis, pain scoring, type of pain treatment (pharmacological or non-pharmacological), pain reevaluation before discharge was developed. Case notes from each patient was also collected. Using the assessment form and the 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 rescoring of pain prior to disposition of patient from the ed whether admitted to the ward or prior to discharge.

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