

Accidental Injury with Chronic Pain among Diabetic Patient; A Case Study

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Abstract: Introduction: Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage. Case A 52 years old diabetic Malay male was admitted to Hospital University Sains Malaysia due to the gunshot injury that he suffered from. The patient received alleged gunshot over the left thigh. Patient underwent an operation of wound debridement, vascular exploration and repair. Postoperatively, patient is complaining of constant pain and was referred to the pain clinic. Conclusion: Uncontrolled diabetes can affect wound healing. Delay in treating patient with accidental injury can lead to depression and affect therapeutic outcome.

Key words: Pain • Patient-Controlled Analgesia (PCA) • Morphine • Accidental Injury

INTRODUCTION

Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage. Being an individual and subjective experience, pain is modulated by physiological, psychological and environment factors such as previous events, culture, prognosis, coping strategies, fear and anxiety. Nociceptive pain can be categorised into somatic and visceral pain. Somatic pain is pain originating from bone, muscle, connective tissue etc. It can be described as aching, sharp, stabbing, throbbing and well localised pain. As for visceral pain, it is originating from organs. This type of pain is described as cramping, dull, colicky, squeezing as well as poorly localised and it may be referred to other areas. Neuropathic pain is often caused by an injury or dysfunction of the peripheral or central nervous system and it often gives the feeling of burning, shooting, stabbing, numbness or tingling. There are two main types of neuropathic pain, that is the central and peripheral. Some people can also experience both

nociceptive and neuropathic types of pain at the same time [1].

Case Presentation: A 52 years old diabetic Malay male was admitted to Hospital University Sains Malaysia due to the gunshot injury. The patient received alleged gunshot over the left thigh in the evening at his house. The patient had sustained bleeding from the left thigh and knee. Upon arrival at the Accident and Emergency (A and E) Department, the patient is still conscious and alert. The patient then underwent an operation of wound debridement, vascular exploration and repair. Post operatively, patient was placed in intensive care unit (ICU) for several days. The patient was then transferred to common ward on postoperative day 4. The patient complained of constant pain and was referred to pain clinic.

On examination, the patient is alert and conscious. The Glasgow Coma Scale (GSC) is 15/15. His blood pressure is 130/82 mmHg, heart rate is 82bpm. Chest examination revealed clear lungs. Cardiac examination showed normal heart sounds without murmurs, rubs or

abnormal rhythm. Dorsal pedal pulse (DPA) and posterior tibial artery (PTA) were not palpable but these were detectable after the operation. It is found that the patient is having vascular injury at femoral artery and distal popliteal artery.

From the laboratory data, the patient's hemoglobin level (7.5-11.9g/dL; normal: 13.5-17.5g/dl), red blood cells level ($2.32-3.32 \times 10^{12}/L$; normal: $3.9-5.6 \times 10^{12}/L$), hematocrit level (19.8-28.3%; normal: 37.4-49.8%) and platelet level ($88-153 \times 10^9/L$; normal: $167-376 \times 10^9/L$) are low due to the blood loss from the injury that he suffered. The CK level is high as the patient is suffering from a muscle injury. The patient's AST, ALT as well as creatinine level are within the normal range.

Post operatively, Patient is given IV fluids and medications to improve his condition.

DISCUSSION

Patient was initially given IV rocuronium 40mg/hour, IV midazolam 4mg/hour and IV morphine 4mg/hour. The IV rocuronium acts as an adjunct to general anesthesia to facilitate both rapid sequence and routine endotracheal intubation and to relax skeletal muscle during surgery; and to facilitate mechanical ventilation in ICU patient. The IV midazolam is given as a sedative. IV morphine is given for its analgesic effect. Post operatively, patient was given IV noradrenaline 8mg/50mL at 4mL/hour. Moreover, noradrenaline is added to local anesthetics to decrease systemic absorption of intra spinal and local anesthetics. IV ranitidine 50mg three times daily was given to prevent stress-induced gastric ulcer and reduce the risk of acid-aspiration syndrome. Fondaparinux 2.5mg was also given once daily through the subcutaneous route to prevent deep vein thrombosis (DVT) and pulmonary embolism (PE) [2].

The doctor had prescribed both IV ceftazidime 1g twice daily and IV cefuroxime 750mg three times daily to current patient as prophylaxive antibiotic. However, both of these drugs are under the cephalosporin group and are having the same mechanism of action. Pharmacist recommended stopping IV ceftazidime, continuing IV cefuroxime and starting IV metronidazole 500mg three times daily. The combination of cefuroxime and metronidazole is recommended by the Malaysia National Antibiotic Guideline 2008 [3]. Cefuroxime is a broad spectrum 2nd generation cephalosporin that covers both gram positive and gram negative microorganisms whereas metronidazole is active against anaerobes.

When the patient is transferred to the common ward, the doctor put the patient under the use of the patient-controlled analgesia (PCA) device with morphine as the drug being given. Morphine inhibits ascending pain pathways, which causes alteration in response to pain. Morphine can lead to the side effects such as pruritus (up to 80%), vomiting (7%-70%), urinary retention; epidural/intrathecal (15-70%), constipation (>10%), headache (>10%), somnolence (>10%) and respiratory depression (5-10%). Thus, when morphine is given to the patient, the patient is monitored in terms of pain, sedation, respiratory rate, blood pressure as well as pulse rate. For current patient, the pain score recorded was showed improvement.

Intravenous PCS is now widely accepted for postoperative pain management.^[5] It is stated that traditional techniques such as intermittent IV or IM injections of an opioid drug do not meet the needs of every patient. PCA allows the patients to self-administer small boluses of opioids, giving a better dose titration and regulation. Besides, PCA is able to minimize the time-delay between perception of pain and administration of medication.^[6] Better analgesic efficacy, decreased risk for pulmonary complications and good patient acceptance are also the advantages over conventional opioid administration methods [4]. When using PCA, the plasma concentration at which the patient becomes sufficiently uncomfortable to make a dose demand is known as the minimum effective (analgesic) concentration (ME(A)C) [5]. For current patient, the bolus dose used is 1mg and lock-out time is 5 minutes. The patient education regarding the use of PCA and device handling could increase therapeutic outcome.

Moreover, the patient was prescribed with paracetamol tablet 1g four times a day to control his pain as well. Hematinic agents that consist of ferrous fumarate, folic acid and vitamin B complex were given to the patient to stimulate blood cell formation or to increase the hemoglobin in the blood

The patient is diabetic and is currently not taking any prescribed medications. It is vital to monitor his blood glucose level since acute metabolic hyperglycemic complication affects cell lines which proliferate rapidly; improper glycemic control affects cellular maturity resulting in a poor wound healing which may manifest as poor capillary bed formation by endothelial cell, weak reticular network laid by fibroblast and abnormal epithelial cell migration. Similarly, other cellular component that includes macrophages and lymphocytes are also affected.

As a result, wound infection can occur and may compromise with other cellular and humoral immune response [6].

CONCLUSION

Management of diabetes with accidental injury is critical. Pain due to accidental injury may lead to depression and affect treatment outcomes, hence unnecessary delay in treating pain should be avoided.

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