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A brief review of relationship between body mass index and spread of spinal block

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Abstract

The level and time block in patients undergoing spinal anesthesia are affected by body mass index [BMI] and the amount of cerebrospinal fluid. So the purposes this review were to evaluate the relationship between BMI and time of spinal block anesthesia in obese patients.

Method: This reviewed study was carried out by doing search in Scholar Google, PubMed and Elsevier databases using keywords such as spinal block, body mass index and obese patients. Approximately 26 articles were selected that were fully reviewed.

Results: our results were obtained on the results of the reviewed articles. Therefore, Sensory and motor blocks recovery time were longer in the obese patients

Conclusion: Based on the result, there are correlation between BMI and the time of spinal block anesthesia. The maximum motor and sensory block specified in obese patients happens faster and the analgesic duration could be prolonged in patients with a higher BMI.

Keywords: body mass index, spinal block, motor block, obese patients

Introduction

Context

Height, weight, body mass index [BMI] and cerebrospinal fluid (CSF) and body posture post-injection affect level and time block in patients undergoing spinal anesthesia. Also, Increases in the prevalence of obesity is an increasing public health concern worldwide [1-3]. So anesthesia in obese patients usually represents a challenge and a significant problem [4, 5]. Previous studies showed influence of obesity on cephalic spread of spinal block (SB) because of lower cerebrospinal fluid (CSF) [6-8]. The decreased CSF volume in obese patients can effect on time and level of the spinal block. [7, 9, 10]. Hence, this review intended to evaluate the relationship between BMI and time of spinal block anesthesia in obese patients.

Method

This reviewed study was carried out by doing search in Scholar Google, PubMed and Elsevier databases. We identified 160 studies. The inclusion criteria were as follows: [1] Published studies as clinical trials evaluating the association between BMI and spinal block. Patients were excluded from the study if complete information on spinal block, BMI, and motor and sensory anesthesia results were not available. After applying the inclusion criteria, 134 studies were deleted and 26 articles remained for inclusion and review.

Results

Our results were obtained on the results of the reviewed articles. Data demonstrates that The level and time block in patients undergoing spinal anesthesia are affected by variables such as BMI, weight, and height. Therefore, the time to reach the maximum sensory block was significantly shorter in the obese patients. Sensory recovery time and onset time motor block were longer in the obese patients. The time to reach the maximum motor block was significantly shorter in the obese patients. The time for the recovery of the motor block was longer in the obese patients.

Discussion

There have been many studies on impact of obesity on the development of spinal anesthesia, but the results are still conflicting [7, 11-13]. Previous studies have shown that CSF volume decreases in obese patients [14]. A possible explanation suggests that the decrease in CSF volume is due to an increase in intra-abdominal pressure or an increase in epidural fat [15, 16]. but, a previous study with endoscopic observation of the epidural space reported that epidural fat did not appear to be associated with BMI [17]. Other studies have compared dose-response relationships in obese and non-obese patients and have reported that ED50 for successful anesthesia in obese patients is no different from ED50 in non-obese patients [18, 19]. Also, Studies have shown that the required time for reaching the anesthetic level of T10 in obese patients was significantly faster [8, 20]. The spread of sensory block in obese patients occurred faster. Taivainen *et al.* showed that the faster occurrence of the sensory level can by the rapid transfer of local anesthetic in the adipose tissue in obese patients [21]. Leino KA *et al.* observed more spread of block in the high BMI group then in the low BMI group [12]. In another studies, demonstrated that injection and induction of local anesthesia

required greater skills in case of obese patients and there was no significant difference in terms of anesthesia time, surgery time and time spent in recovery between in obese and non-obese patient in spinal anesthesia [22-24]. Many studies point to the level and duration of sensory and motor block by spinal anesthesia in non-obese patients showed interesting results compared to obese patients. The sensory and motor block level had increased in obese patients, but block time had decreased. [25, 26].

Conclusion

Based on the result, can be concluded that different methodologies in the study have led to contradictory results. In general, the maximum motor and sensory block specified in obese patients happens faster and spinal anesthesia can be significantly prolonged

Conflict of Interests

The authors declare that they have no conflicts of interest

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