ORIGINAL ARTICLE

Does Epidural During Labour Lead To Chronic Low Backpain? A Malaysian Retrospective Study

Muhamad Rafiqi Hehsan[1,2], Wan Fadzlina Wan Muhd Shukeri[1], Shamsul Kamalrujan Hassan[1], Hoo Pek Sung[3]

[1] Department of Anaesthesiology and Intensive Care, School of Medical Sciences, Health Campus, Universiti Sains Malaysia, 16150 Kubang Kerian, Kelantan, Malaysia
[2] Faculty of Medicine and Health Sciences, Universiti Sains Islam Malaysia, Bandar Baru Nilai, 71800, Nilai, Negeri Sembilan, Malaysia
[3] Department of Obstetrics and Gynaecology, School of Medical Sciences, Health Campus, Universiti Sains Malaysia, 16150 Kubang Kerian, Kelantan, Malaysia

ABSTRACT

Introduction: The question as to whether epidural analgesia during labour can cause chronic low backpain has become a concern lately but this association has not been tested locally and remains controversial. This retrospective study aimed to ascertain the relationship between labour epidural analgesia and development of subsequent chronic low backpain. **Methods:** We contacted 200 primiparous women who had delivered by normal vaginal delivery via telephone at six months after delivery. While 100 of them had previously received epidural analgesia for labour, the other 100 had not. The women had to quantify their backpain by yes/no responses, numeric rating score, and impairment of daily function. Both the epidural and the non-epidural groups were compared using independent t-test and Chi-squared test while logistic regression was used to control for confounding factors. **Results:** The two groups had similar baseline characteristics except for body mass index, employment status and labour duration. The women who received epidural analgesia had significantly higher prevalence of low backpain at six months after delivery than those who had not (28% versus 9%, P = 0.001). However, the two groups did not show any difference in terms of numeric rating score or level of impairment of daily function. The low back pain at six months (epidural versus non-epidural) had an adjusted odds ratio of 8.1 (95% confidence interval 2.7 to 24.0, P <0.001). **Conclusion:** While epidural analgesia during labour was shown to be associated with chronic low back pain, this association may not be causal, suggesting the need for a randomized-controlled study in this area.

Keywords: Epidural, Chronic, Back Pain, Malaysia

Corresponding Author:
Wan Fadzlina Wan Muhd Shukeri, PhD
Email: wfadzlina@usm.my
Tel: +6012-987 9150

INTRODUCTION

Epidural analgesia is deemed as the best treatment for pain relief during labour. In Malaysia, the first obstetric analgesia with epidural was only performed in 1989 (1), that is, about 30 years after it was first popularized. Since then, labour epidural analgesia has steadily gained its popularity with increasing number of women requesting the services during labour. However, surveys to specifically assess current obstetric anaesthesia practices within Malaysia are lacking with the only available local survey being conducted 21 years ago. This survey found that in the year 2000, labour epidural analgesia services were available in 82.4% of government hospitals and all private hospitals nationwide (2). Interestingly, in the last five years, there has been a widespread publicity in the social media the perception that epidural analgesia used during labour can lead to development of new onset chronic or long-term backpain.

Our review of the current literature indicated that all the studies on the relationship between labour epidural analgesia and chronic backpain were conducted mostly in the Western populations (UK, USA, Canada and Lithuania) (3-11) and one study in Pakistan (12). For such a frequently and routinely performed procedure in our local setting, we consider it desirable to establish our own findings as to whether or not labour epidural analgesia is indeed free from long-term morbidity, specifically chronic low backpain. Factors such as smaller body weight, height, and body mass index (BMI) among Malaysians as compared to the Caucasians, may have led to different results being obtained in our population (13). Furthermore, the connection between epidural analgesia for labour and the subsequent development of chronic low backpain remains controversial because while several studies have demonstrated an association

(3-7), others have not shown increased risk of backpain after using epidural (8-12).

This retrospective cohort study sought to answer the following research question: Does the use of epidural analgesia during labour lead to chronic low backpain? Therefore, the current study primarily aimed to ascertain whether it was common for women who received epidural analgesia during labour to experience new onset chronic low backpain six months after delivery compared with those who did not in our local setting. Secondarily, we aimed to assess the severity of the backpain and its related disability, which were not extensively addressed in the previous studies. We also aimed to examine if the use of labour epidural analgesia was independently associated with the subsequent development of chronic low backpain.

MATERIALS AND METHODS

This retrospective cohort study was conducted in one of the university-affiliated hospitals in Malaysia. The hospital has a major obstetric unit with about 8,000 to 10,000 deliveries per year. The study protocol was reviewed and granted approval for implementation by the institution Human Research and Ethics Committee (study protocol code: USM/JEPeM/20020120). To achieve 80% power with an α error of 5% to detect 2.5-fold increased risk of post-delivery backpain in women administered with epidural analgesia (9), a sample size of 200 was needed given that low backpain occurred at an estimated 12% prevalence in the non-epidural group (10).

We reviewed the labour room admission book from September 2019 to June 2020 to identify women who were eligible to be enrolled into this study. The inclusion criteria were primiparous women who gave birth to their first baby via normal vaginal delivery. We excluded multiparous women because the previous delivery might already cause backpain. Therefore, they could not develop new onset backpain due to the more recent delivery. Women who had history of chronic low backpain or spine deformity or joint hypermobility and those who delivered by Caesarean section were also excluded.

The eligible women were called six months after delivery by a research nurse who was unaware of the patient grouping following the provided home or mobile telephone number. We asked the consented women to report on the presence of low backpain (yes/ no), which was the primary outcome. If backpain was reported, the women were asked to quantify the severity of the pain based on the 11-point Likert scale (numeric rating scale) (14) with 0 being no pain and 10 being the worst pain imaginable, and to detail the extent of disability to which the backpain impaired their daily function using the validated, Malay-translated Oswestry Disability Index questionnaire (15). This were the secondary outcomes. Permission to use this questionnaire has been obtained from its copyright holder. In brief, 10 main questions with six subdomains were asked: pain intensity, travelling, personal care, walking, standing, sitting, sex life, sleeping, social life and lifting. The score ranges from 0 to 100% and its interpretation is provided in Table I.

Table I: Interpretation of Scores Oswestry Low Back Pain Disability Questionnaire

Scores	Interpretation
0% to 20%: minimal disability	The patient can cope with most living activities. Usually no treatment is indicated apart from advice on lifting sitting and exercise.
21%-40%: moderate disability	The patient experiences more pain and difficulty with sitting, lifting and standing. Travel and social life are more difficult and they may be disabled from work. Personal care, sexual activity and sleeping are not grossly affected and the patient can usually be managed by conservative means.
41%-60%: severe disability	Pain remains the main problem in this group but activities of daily living are affected. These patients require a detailed investigation.
61%-80%: crippled	Back pain impinges on all aspects of the patient's life. Positive intervention is required.
81%-100%	These patients are either bed-bound or exaggerating their symptoms.

The baseline demographic and obstetric data of the women were extracted from their medical chart. Demographic data include their age, BMI, education level, employment status and marital status, while obstetric data were their duration of labour and birth weight of the new-borns.

Differences between the epidural and non-epidural groups on the age, BMI, duration of labour, birth weight, Oswestry Disability Index and numeric rating scale pain scores were tested using independent t-test. Meanwhile, Chi-squared test was used to determine the differences in the proportion of women in each group in terms of education level, employment status, marital status and low backpain. To correct the potential confounders, a multivariable logistic regression analysis was performed. The adjusted odds ratio for epidural was reported with 95% confidence interval. P values of less than 0.05 were considered statistically significant. The statistical analysis was conducted using SPSS, version 26.0 (IBM software).

RESULTS

Throughout the study period, a total of 339 women were screened for eligibility. From this, 102 (30%) women were excluded based on the exclusion criteria and 37 (11%) failed to be contacted. Therefore, the remaining 200 (59%) were included in the analysis.

Baseline demographic and obstetric characteristics

Of the 200 women who were analysed, 100 (50 %) were under the epidural group whereas the others (100; 50%) received other mode of pain relief during labour (non-epidural group). Table II summarizes the baseline demographic and obstetric characteristics of the respondents. Women in both groups were similar in terms of education level, age, marital status, and birth weight of their new-borns. However, compared to those from the non-epidural group, the epidural group had a significantly higher BMI (29.0 ± 4.6 versus 26.9 ± 3.2 kg/m^2, P = 0.030). The majority of the women in the epidural group were from the working class (63% versus 48%, P = 0.033). Women who had received epidural also had a significantly longer duration of labour than those who had not (6.9 ± 2.5 versus 3.1 ± 2.9 hours, P <0.001).

Table II: Baseline Demographic and Obstetric Variables of Women Receiving Non-Epidural Analgesia versus Epidural Analgesia

Variables	All (n = 200)	Non-epidural analgesia (n = 100)	Epidural analgesia (n = 100)	*P* value
Demographic				
Age (years)	27.0 ± 3.4	26.9 ± 3.2	27.1 ± 3.6	0.758
BMI (kg/m^2)	28.3 ± 4.5	27.6 ± 4.3	29.0 ± 4.6	0.030
Education level				0.765
Secondary	68 (34.0)	33 (33.0)	35 (35.0)	
Tertiary	132 (66.0)	67 (67.0)	65 (65.0)	
Employment status				0.033
Housewife	89 (44.5)	52 (52.0)	37 (37.0)	
Working	96 (55.5)	48 (48.0)	63 (63.0)	
Marital status				1.000
Married	200 (100)	100 (100)	100 (100)	
Unmarried	0 (0)	0 (0)	0 (0)	
Obstetric				
Duration of labour (hr)	5.0 ± 3.3	3.1 ± 2.9	6.9 ± 2.5	<0.001
Birth weight (kg)	2.9 ± 0.4	2.9 ± 0.4	2.9 ± 0.4	0.553

Values are presented as mean ± SD or number of subjects (%). BMI: Body mass index.

Primary and secondary outcomes

The primary outcome of new onset chronic low back pain was noted in 37 out of the 200 (18.5%) women. Twenty-eight of the 100 (28%) women in the epidural group developed new onset back pain persisting six months post-delivery, compared to nine (9%) women in the non-epidural group (P = 0.001) (Table II). Among those who developed new onset chronic low back pain, the pain was moderate in severity with mean numeric rating scale pain score of 5.1 ± 1.1 while the associated functional impairment was minimal with Oswestry Disability Index of 14.7 ± 6.7 %. Of note, no significant difference was observed in the numeric rating scale pain score and pain-related functional impairment between the two groups (Table III).

Independent association between epidural analgesia and new onset chronic low backpain

Subsequently, to obtain the independent value of epidural analgesia for chronic low backpain, we performed a binary logistic regression analysis with backpain as the dependant variable, and baseline characteristics with P <0.2 as the covariates, using the enter method. After adjustment for baseline imbalances (BMI, employment status and duration of labour), the adjusted odds ratio of labour epidural analgesia for development of new onset chronic low back pain was 8.1 (95% CI 2.7 to 24.0, P <0.001) (Table IV). No other variables remained as independent risk factors for development of new onset backpain (Table IV).

Table III: Primary and Secondary Outcomes of Women Receiving Non-Epidural Analgesia versus Epidural Analgesia

Outcomes		Non-epidural analgesia (n = 100)	Epidural analgesia (n = 100)	*P* value
Primary (n = 200)				
New onset backpain	37 (18.5)	9 (9.0)	28 (28.0)	0.001
Secondary (n = 37)				
Pain score	5.1 ± 1.1	5.4 ± 1.0	5.0 ± 1.1	0.298
Oswestry Disability Index	14.7 ± 6.7	14.4 ± 5.5	14.7 ± 7.1	0.918

Values are presented as mean ± SD or number of subjects (%).

Table IV: Independent Risk Factors for Development of New Onset Backpain

Variables	Odds ratio	95% confidence interval	*P* value
BMI	0.9	0.9 – 1.0	0.196
Employment status	0.8	0.4 – 1.8	0.630
Duration of labour	0.9	0.7 – 1.0	0.068
Epidural analgesia	8.1	2.7 – 24.0	<0.001

BMI: Body mass index.

DISCUSSION

In our attempt to find a relationship between labour epidural analgesia and chronic low backpain, we found that the prevalence of new onset chronic low backpain at six months after delivery was significantly higher in women who were given epidural analgesia during labour compared to those who were not. However, no difference was detected between the epidural and non-epidural groups with regards to backpain score or level of backpain-related functional impairment. The backpain was moderate in severity and the functional impairment was minimal in both groups. After adjusting for the potential confounders, we found that using epidural analgesia during labour remained as an independent risk factor for the subsequent development of chronic low backpain after normal vaginal delivery.

The findings from our study supports the previous

retrospective studies by others that that administration labour epidural analgesia was associated with development of subsequent chronic low backpain (3-7). In our group of women who received epidural during labour, the prevalence of new onset low backpain persisting at six months after delivery was 28% which was similar to the prevalence at one year found by MacLeod et al. (26.2%) (7), but considerably higher than the incidence at six months as reported by MacArthur et al. (18.9%) (3) and Russel et al. (17.8%) (4). The prevalence of chronic low backpain of 9% in the non-epidural group is similar to that reported in most of the previous work by others (3-5, 9). It has been suggested that poor posture and immobility were caused by the non-selective nerve block created by the epidural administration of local anaesthetics and the muscular relaxation in the lower back and legs (3). Consequently, the stressed positions in labour may damage the back and lead to long-term or chronic backpain.

The association between labour epidural analgesia and subsequent chronic low backpain suggested by our findings was not proven in prospective cohort studies and a randomized controlled trial (8-12). In the first prospective cohort study of 1042 women in USA, Breen et al. concluded no association between epidural analgesia for labour and backpain at one to two months post-delivery (6). A year later, MacArthur et al. whom studied 329 women in Canada concluded that women administered with epidural analgesia during labour only had a higher incidence of low backpain on the first day after giving birth but not at six weeks (8). More recently, Howell et al. whom performed a randomized controlled trial of 369 women in UK concluded no correlation between the use of epidural analgesia during labour and the development of chronic low backpain (10). The study did not find any significant difference in the prevalence of chronic backpain between women administered with epidural analgesia and those who were not. Shemila Abbasi et al. performed a non-randomised prospective direct and telephonic survey of 482 women in Pakistan and reported that the epidural analgesia was not associated with post-partum back pain (12). More recently, Anastasija Malevic et al in prospective continuous survey of 212 women in Lithuania also found the same as other prospective study (11).

Interestingly, we found in our study that women who had received epidural had a significantly longer duration of labour than those who had not, which could have served as a potential confounder for the reported backpain. However, in a recent metanalysis, no obstetric-related factors were reported as a significant cause of post-partum backpain including the duration of labour (16). According to this metanalysis, factors that were significantly associated with development of backpain after delivery include a previous history of low backpain, pre-pregnancy BMI of more than 25 kg/m2 and heavy workload in pregnancy. Furthermore, in order to control for potential confounders, we have performed a multivariable logistic regression analysis by including the duration of labour as a covariate. Following this analysis, we found that the adjusted OR for epidural remained as an independent risk factor for development of subsequent low backpain, although we are not suggesting that the relationship is causal.

The inconsistencies in the obtained results in the previous works raises the possibility of the retrospective studies being flawed by recall bias since the women were not randomized and consequently were self-selected from one treatment over another. Therefore, our study, being retrospective in nature, could not confirm a causal relationship between labour epidural and subsequent low backpain despite the statistically significant relationship demonstrated. We consider this as the major limitation of our study. Furthermore, reporting of the backpain by the women may reflect the emotional reactions towards receiving epidural analgesia during labour. In Malaysia, since the emergence of the sentiment in the social media in the last five years, epidural has been notoriously deemed to cause long-term backpain. If a woman administered with epidural analgesia expects to develop backpain, such a symptom tends to become focal.

Although our findings might be flawed by recall bias and psychological factors, the current study was the first to test whether epidural analgesia for labour was associated with chronic backpain in the Malaysian population. The results obtained in this study imply that a randomized controlled trial is worth to be conducted in order to confirm or refute our current findings, especially considering that epidural analgesia for labour is a routinely performed procedure.

CONCLUSION

In conclusion, we demonstrated that labour epidural analgesia was associated with the development of new onset chronic low backpain although the backpain was moderate in severity and minimally interfered with the daily function of the women. However, given the retrospective nature of our study design, such an association does not confirm causation. Therefore, a further randomized controlled trial is necessary to establish whether or not epidural analgesia is actually correlated with chronic low backpain.

ACKNOWLEDGEMENTS

The authors would like to acknowledge the labour room and record unit staffs, Hospital Universiti Sains Malaysia (HUSM) for facilitating the process of data collection. This study obtained financial support and sponsorship from Geran penyelidikan sarjana perubatan (GPSP) 2020, account's grant number 1001/PPSP/8070011.

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