THE FREQUENCY OF EPIDURAL CATHETER MIGRATION IN PATIENTS RECEIVING EPIDURAL ANALGESIA DURING LABOR INCREASES WITH TIME

Ahmed Farooq, Arshad Taqi, Shahida Khawaja*

Hameed Latif Hospital Lahore Pakistan, *Rashid Latif Medical College Lahore Pakistan

ABSTRACT

Objective: To determine the frequency of epidural catheter migration and its relation with duration in situ in patients receiving epidural analgesia during labor.

Study Design: Descriptive case series.

Place and Duration of Study: Hameed Latif Hospital Lahore from Jun 2014 to Dec 2014.

Material and Methods: Extent of catheter migration was studied in 240 patients receiving epidural analgesia for labor analgesia. Epidural catheters were removed immediately after delivery and Duration of catheter in place and migration either inwards or outwards was noted for each. Data was stratified for duration of catheter placement into two groups. Group 1 with catheter placed for <330min and group 2 for > 330min.

Results: 240 patients in labor were included in this study. Mean age was 26.60 ± 3.856. Mean distance of catheter migration was 2.92 ± 4.756 mm. 86 of the 240(35.8%) patients had catheter migration, inwards 25/86 (29.06%) while outwards in 61/86 (70.93%).Data was stratified for duration of catheter placement into two groups. Group 1 with catheter placed for <330min and group 2 for > 330min.Group 1 included 124 (51.66%) patients; catheter migrated in 29 (23.39%).Group 2 included 116(48.33); catheter migration occurred in 57 (49.13%).

Conclusion: Epidural catheter migration was observed in significant number of parturients. There was a relation observed between duration of catheter and extent of migration at 330 minutes.

Keywords: Epidural, Labor Analgesia, Catheter, Migration.

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INTRODUCTION

Epidural anesthesia is widely employed for regional anesthesia and relief of labor, postoperative and chronic pain. The technique can be used as a single shot or by placing catheter into the epidural space[1-3]. The use of catheter allows for administration of drugs as intermittent boluses or a continuous infusion[4].

Placement of catheter is associated with problems like kinking, knotting, breakage and dislodgement or migration[5,6]. Change of posture, type of epidural catheter or needle may influence the rate of migration[7,8]. Catheter migration carries potential risks of inadequate analgesia, subdural, spinal or intravascular injection[9,10]. Different techniques for prevention of catheter migration have been proposed[11]. The chances of migration were found to be 71% within 24 hours of fixation in catheters placed for postoperative analgesia[9]. This study was undertaken to measure the extent of catheter migration in patients receiving labor analgesia since the duration of catheter stay is shorter in this population group.

MATERIAL AND METHODS

This descriptive case series was conducted at Hameed Latif Hospital Lahore from Jun 2014 to Dec 2014 on all ASA 1 and 2 laboring patients receiving labor analgesia through epidural catheter technique. Sample size of 240 cases was calculated based on 71% chances of catheter migration with 6% margin of error, 95% confidence level. Non probability purposive sampling technique was used. Morbidly obese and patients with spine deformity were excluded.

After approval from Hospital Ethical Committee and obtaining an informed consent,

Correspondence: Dr Ahmed Farooq, 290-B PCHS, Main Defence road, Lahore, Pakistan (*Email:ahmedfarooqdr@gmail.com)*

Received: 22 May 2015; revised received: 09 Jul 2015; accepted: 24 Jul 2015

the demographic information and ASA status was recorded. All epidurals were given by Consultant anesthetist. L3-L4, L4-L5 inter vertebral space was targeted with needle in sitting position using midline approach. The mark at which catheter was fixed and time of fixation was noted. After applying tincture benzoate on skin, catheter was singly looped around fixation point with a strip applied on loop and finally covered by standard Opsite dressing. catheter was removed at end of normal delivery; position of the catheter was assessed and noted for any migration either inwards or outwards along at the time of catheter removal. Duration of catheter in situ was recorded on designed proforma. Catheter displacement greater than 5 mm was recorded as a positive catheter migration.

All the data was collected and developed using SPSS version 11. The variables like age and extent of catheter migration were calculated as mean standard deviation; catheter migration (yes/No) by calculating frequency and percentages. Data was stratified for duration of epidural catheter and migration of catheter, inwards or outwards by usingpearson chi square test.

RESULTS

Two hundred and forty patients in labor were included in this study. No patients were excluded because of technical difficulties during catheter insertion. Catheter migration was labeled as either inwards or outward movement of catheter from point of fixation on skin. The mean age was 26.60 ± 3.856 years. Mean distance of catheter migration was 2.92 ± 4.756mm. Catheter migration was noted in 86/240 (35.8%) patients.Migration inwards was in 25/86(29.06%) while outwards in 61/86(70.93%). Data was stratified for duration of catheter placement into two groups based on equal number of patients in each. Group 1 with catheter placed for <330min and group 2 for > 330min.Group 1 included 124(51.66%) patients; catheter migration was noted in 29 (23.39%) cases.Group 2 included 116(48.33%)patients; catheter migration was noted in 57 (49.13%) cases. This difference was statistically significant.

Table-1: Relationship of epidural catheter migration with its duration in situ.

Duration of stay (Min)		Migration				Total patients	*p*-value
		No		Yes			
		count	%age	count	%age		
Group 1	<330	95	76.61%	29	23.38%	124 (51.66%)	<0.001
Group 2	≥330	59	50.86%	57	49.13%	116 (48.33%)	
Total		154		86		240	

DISCUSSION

Overall incidence of epidural catheter migration was 35.8% in our study.The frequency of catheter migration increasedwith the duration of stay in situ i.e. 23% vs 49% when catheter migration was compared between two groups (<330 min vs> 330 min) in laboring patients.

The incidence of migration or displacement of epidural catheters studied by Motamed c et al[9] using computed tomography (CT) epidurographies after major abdominal surgery was 45%. They were able to establish a relationship of catheter migration with time duration and found that migration occurred either early in PACU i.e. 71% at day 0, or late in surgical ward i.e. 37% at day 1 and 2 both and major cause of failure was migration. However it was conducted in PACU and time duration was in days. In our study the population was all laboring patients and the observed time duration is shorter i.e. in minutes/hours as compared to days. We also found that the tendency of catheter migration is 36.8%; comparable with above study's findings. The catheter migration starts within hours of its fixation and it increases with

time. This migration is statistically significant (p<0.001) when compared by dividing the study patients in two groups according to the duration of stay; less than 330 min stay and equal to or more than 330 min.

The incidence of accidental dislodgement of epidural catheter reported by Brustalet al[15] and Ballantyneet al[17], in surgical patients, was between 10%-13%. According to the later study, the contribution of dislodgement responsible for inadequate epidural analgesia was as high as 66%. However, McLeod[16] have demonstrated 2%-3% cases of catheter dislodgement in surgical patients; half of these dislodgements occurred within the first 36 hours of placement.

The reason for these discrepancies is not clear however certain factors like method of catheter fixation[11,13,14]and role of skin movement and posture[7]may affect frequency of catheter migration. It has been studied mostly in post surgical patients there is an intuitive assumption that increasing movement and sweating during second stage of labor can contribute to catheter dislodgement in obstetric population; our study was not designed to look at this question, however our data did not suggest an increased overall incidence of migration in this population group; magnitude of problem was comparable to surgical patients. Catheter dislodgement or migration, however, is one of leading causes of analgesia failure and subsequent catheter manipulation has been shown to convert them into successful epidural blocks in parturients as well[12].

This study was an observational study that only compared the extent of catheter migration at one point in time. In the background of Motam's study there seems to be a trend towards increasing risk of catheter migration with time. This, however, does not inform us about a relation with time, if it at all exists.

We used our standard technique for catheter fixation, we are not sure if technique of catheter fixation has an impact on migration.

CONCLUSION

Epidural catheter migration was observed in significant number of parturients. There was a relation observed between duration of catheter and extent of migration at 330 minutes. Larger data, particularly one focusing on prolonged labor may reveal this relation at other points in time.

CONFLICT OF INTEREST

This study has no conflict of interest to declare by any author.

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