

HAEMATOMA BLOCK- AN EFFECTIVE ALTERNATIVE TO GENERAL ANAESTHESIA FOR REDUCTION OF DISTAL RADIUS FRACTURES

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ABSTRACT

BACKGROUND

Most common fracture in elderly patients is distal radius fracture. The most common method of management is closed reduction and immobilisation. The aim of the study is to compare the analgesic effects of haematoma block and general anaesthesia for closed reduction of distal fracture of radius.

MATERIALS AND METHODS

A prospective randomised controlled study was carried out among 100 patients of age group between 15-70 years of either sex who had fracture distal radius between 2015-2016. The patients having multiple fractures, pathological fractures or suffering from any organic diseases were excluded from the study. After taking informed written consent, the patients were randomised into two equal groups. In group A, reduction of fracture was done following administration of IV propofol and in group B after infiltration with 2% lignocaine into fracture haematoma site. Pain score was compared by VAS before, during and after manipulation in both the groups. Time taken from presentation at emergency department to reduction and discharge from hospital was also compared. Statistical analysis was done by applying SPSS software.

RESULTS

100 patients of mean age 42.5 years, male: female 43:57 with fracture distal radius were studied. Mean time from admission to fracture reduction in group A was 2.64±0.93 hours and in group B 0.90±0.45 hours (P=0.0001). Discharge time from hospital after reduction of fracture in group A was 4.24±0.94 hours and in group B 0.75±0.2 hours (P=0.0001). VAS during reduction in group A was 0 and in group B 0.98±0.8 (P=0.0001). 10 minutes after reduction VAS in group A was 2.28±0.24 and group B 0.72±0.45 (P=0.0001).

CONCLUSION

For closed reduction of distal radius fracture, haematoma block with lignocaine is safe and effective alternative to intravenous general anaesthesia with propofol.

KEYWORDS

Distal Radius Fracture, Closed Reduction, Lignocaine, Haematoma Block, General Anaesthesia, Propofol.

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BACKGROUND

Distal radius fracture is most common fracture of musculoskeletal system. It accounts for about 16% of all fractures treated at emergency department.^{1,2,3,4} Fracture distal radius is most common in elderly and more in females than males.^{5,6,7} It usually occurs due to minor fall than severe trauma.^{8,9}

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Various methods are used to decrease the pain during closed reduction of fracture radius like brachial plexus block, intravenous regional anaesthesia, general anaesthesia, conscious sedation and haematoma block. Each of these methods have certain merits and demerits.⁷

The aim of the study was to compare the efficacy of haematoma block with intravenous general anaesthesia for closed reduction of distal radius fracture.

MATERIALS AND METHODS

This was a prospective randomised controlled study done in 100 patients of age group between 15-70 years of either sex at MKCG MCH, Berhampur, Odisha, between 2015-2016 posted for closed reduction of distal radius fracture at orthopaedic OT. After taking approval from hospital ethical committee and informed written consent, the patients were

randomised into two equal groups. Group A consisted of 50 patients receiving IV general anaesthesia and group B comprising 50 patients receiving haematoma block. The following parameters were compared between the two groups.

1. Pain score by VAS before, during and 10 minutes after reduction (VAS on scale of 0-10, zero no pain and ten being intense pain).
2. Time from presentation to hospital to reduction of fracture and time taken for discharge from hospital following reduction.

Patients having multiple fractures, pathological fractures and suffering from any organic diseases were excluded from the study.

Preanaesthetic evaluation was done in all the patients of study group. In group A, NPO was confirmed. Inside OT, suitable intravenous line was secured and multipara monitor connected for continuous monitoring of Pulse Rate (PR), Respiratory Rate (RR), Blood Pressure (BP) and Oxygen saturation (SpO₂).

Group A received propofol 2 mg/kg IV bolus followed by maintenance of 100 microgram/kg/minute. In group B, following proper sterilisation of the affected part, haematoma was confirmed by aspiration of 1-2 mL of old haematoma blood. 10 mL of 2% lignocaine was injected into the haematoma at the dorsal aspect of wrist and also into the adjacent periosteum in an aseptic manner. Massaging was not done after lignocaine injection. Reduction of fracture was allowed 10-15 minutes after injection of the drug.¹⁰ Immobilisation was done following reduction.

Patients were not given any other analgesic before the procedure. Pain score by VAS was recorded before, during and 10 minutes after reduction of fracture. Total time in presentation at emergency department to reduction and discharge from hospital after reduction of fracture was compared between the groups.

Statistical Analysis

Quantitative data analysis was done with Student’s t-test by applying SPSS software.

RESULTS

Demographic data like age and sex were comparable in both the groups in table 1.

Characteristics	Group A n=50 (mean±S.D)	Group B n=50 (mean±S.D)	P value
Age in years	43.58±18.68	44.96±18.39	0.71
Male:female	22:28	21:29	0.83

Table 1. Demographic Data

The above table shows demographic characteristics of the study population. The mean age in years was 43.58±18.68 in group A and 44.96±18.39 in group B. The ratio of male: female was 22:28 and 21:29 in group A and B, respectively.

However, there is no statistically significant difference in age and sex between the study groups P>0.05.

Characteristics	Group A n=50 (mean±S.D)	Group B n=50 (mean±S.D)	P value
Mean time from presentation at emergency department to reduction in hours	2.64±0.93	0.90±0.45	0.0001
Mean time for discharge of patient after reduction in hours	4.24±0.94	0.75±0.2	0.0001

Table 2. Mean Time Comparison between Groups

The above table shows mean time of presentation at emergency department to reduction and from reduction to discharge of patient from hospital in group A and B.

The mean time of presentation at the emergency department to reduction in group A was 2.64±0.93 hours and group B 0.90±0.4 hours, P=0.0001. This was due to the time taken for preparation of the patient for general anaesthesia in group A. The mean time of discharge of the patient from hospital in group A was 4.24±0.94 hours and group B 0.75±0.2 hours, P=0.0001. The more time required in group A was due to the time taken by the patients for the complete recovery from general anaesthesia.

This implies that there is highly statistical significant difference among the groups P<0.05*.

Characteristics (VAS)	Group A n=50 (mean±S.D)	Group B n=50 (mean±S.D)	P value
Before reduction	7.62±1.32	7.64±1.16	0.936
During reduction	0	0.98±0.8	0.0001
10 mins. after reduction	2.28±0.24	0.72±0.45	0.0001

Table 3. Visual Analogue Scale (VAS)

Pain score (VAS) for reduction of fracture was recorded at different time intervals like before, during and 10 minutes after reduction (Table 3).

Before reduction, there was no difference of VAS in both the groups.

During reduction, VAS in group A was 0, this was due to the cortical depression by general anaesthesia, so there was no perception of pain by the patient during the procedure. However, in group B, it was 0.98±0.8.

10 minutes after reduction, VAS in group A was 2.28±0.24 and group B was 0.72±0.45. Post reduction less VAS observed in group B could be explained by analgesia provided by long action of local anaesthetic deposited in haematoma site.

This denotes that there is highly statistical difference among the groups during reduction and 10 minutes after reduction $P < 0.05^*$.

In group A, 2 patients developed hypotension that was managed with IV fluids and 3 patients developed fall in oxygen saturation, which was managed by giving supplemental oxygen.

DISCUSSION

There are different methods to relieve pain during reduction of fracture of distal radius as described by different authors each having its own merits and demerits. Haematoma block has been studied as a procedure for fracture reduction by various authors.

Kendel et al⁵ studied haematoma block in 1995. The increasing cost and time taken for general anaesthesia in comparison to haematoma block for reduction of distal radius made haematoma block more popular.

Singh et al⁴ did a comparative study between haematoma block and conventional sedation in 1992 and found that pain score in haematoma block was significantly low in comparison to sedation group.

Bajracharya¹¹ compared results of brachial plexus block and haematoma block for reduction of fracture radius in 2008. He found no difference in analgesic effect between the study groups.

Funk⁷ in a study compared the VAS during reduction of fracture radius between IV general anaesthesia and haematoma block and found that VAS in general anaesthesia group was zero and haematoma block was 3.7.

Demographic data in our study is comparable to other studies showing mostly elderly and females affected by this fracture.⁵

In our study, VAS during reduction in group B was 0.98 ± 0.8 and group A was 0, $P = 0.0001$. This is different from the result obtained by Funk. This might be due to waiting for 15 minutes after giving lignocaine into the haematoma for the block to be effective - the procedure followed in our study.

Post reduction pain score in our study is comparable to study by Funk. We obtained a score of 2.28 ± 0.24 in group A and 0.72 ± 0.45 in group B. This could be explained by the fact that propofol that has no analgesic effect whereas in group B the drug administered was lignocaine - a local anaesthetic, which also contributed to post procedure analgesia.

In our study, we found a significant difference in mean time from admission to reduction of fracture between the two groups. The more time required in group A was due to time taken for preparation for general anaesthesia. Time taken to discharge the patient from the hospital after reduction of fracture was also more in group A compared to group B. These findings were also similar to the study of Funk.

Usually, general anaesthesia requires an operation theatre, anaesthesia machine, a source of oxygen, fasting protocol of at least 6 hours and continuous monitoring, which is time consuming and costlier.

Haematoma block for reduction of distal fracture radius can be done as Non-Operating Room Anaesthesia - NORA, at emergency department itself. Moreover, it can be done in a set up where a skilled anaesthetist is absent or proper OT set up is not available.

Limitations

1. During haematoma block by infiltration, the close fracture maybe converted to an open fracture giving way for the entry of microorganisms thereby causing infection.¹² However, in our study, we did not witness any such complication, which could be because of strict aseptic protocol being followed.
2. The quality of reduction, however, could not be assessed in our study. This was because the patients did not turn up for regular follow up.

CONCLUSION

Thus, we conclude that haematoma block for reduction of distal fracture radius is a safe, simple and effective alternative to general anaesthesia.

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