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EVALUATION OF IV DEXAMETHASONE FOR HEMODYNAMIC STABILITY IN LOWER LIMB ORTHOPAEDIC SURGERY

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ABSTRACT

Elderly patient undergoing surgery have special consideration that are to be taken care of. They are more likely to develop hemodynamic instability after anaesthesia. A randomized placebo controlled, dose finding study was conducted on a series of 120 patients of either sex, more than 60 years of age on selective population of Bundelkhand region , hospitalized for lower limb orthopaedic surgeries under spinal blockade to assess role of IV desamathasone given perioperatively; on haemodynamic stability in elderly patients. The selected patients were divided into four groups of 30 patients each, where in group I 4ml of IV saline was given which served as control group, while in the study groups-II(D8), III (D12), IV(D16)-8mg,12 mg&16mg IV dexamethasone was given, just before giving spinal blockade. Haemodynamic stability was maintained in all the groups Conclusion: dexamethasone in dose of 16 & 12 mg. or may be higher is a valuable tool added to the armamentarium of the present day anaesthesiologist in combating postoperative pain as haemodynamic stability was maintained in all groups.

KEYWORDS: Dexamethasone, Orthopaedic Surgery, Haemodynamic Stability

As elderly patients have diminished cardiac reserve, sympathetic tone and decreased adrenergic activity for surgical stress they are more likely to develop hemodynamic instability after anaesthesia. They develop profound hypotension after spinal anesthesia.

Postoperative pain does not directly cause death, but may produce adverse effect and morbidity, affecting the overall surgical outcome.it impairs cough mechanism, ability to expectorate and carry out breathing exercises more in elderly age group. Stimulation of sympathetic nervous system leads to an increase in blood pressure, heart rate and increased myocardial oxygen demand (Barnes 1998).

The aforesaid problems are detrimental for the elderly patients, leading to increased morbidity and mortality. With improved health care facilities and control over communicable disease,life expectancy has dramatically increased over the past few decads. Moreover,a major portion of these surgeries would be related to orthopaedics, especially of the lower limb, as this population being vulnerable to fractures even from a trivial trauma or fall (Baxendale 1993).

Several randomized clinical trials in many surgical procedures have been done to see the analgesic, anti-inflammatory, immune modulating and anti-emetic effects of a perioperative single dose glucocorticoid administration (Bisgaard 2001, Fujii et al., 2000).

It was therefore though worthwhile to assess role of IV desamathasone given perioperatively on haemodynamic stability in elderly patients undergoing lower limb orthopaedic surgery under spinal anesthesia.

MATERIALS AND METHODS

After obtaining ethical approval, a randomized placebo controlled, dose finding study was carried out on 120 patients of either sex, more than 60 years of age and belonging to ASA grade I and II.

A well informed and written consent was taken from every patient. Patients having any contradiction for steroid administration including diabetes mellitus, renal failure are excluded from the study.

Patients were than randomly divided into four groups of 30 patients each.

Group I: patients were given 4 ml. saline intravenously to serve as control group.

Group II: patients were given 8 mg. dexamethasone diluteted to 4 ml iv

GroupIII: patients were given 12 mg.dexamethasone diluteted to 4 ml

GroupIV: patients were given 16 mg.dexamethasone diluteted to 4 ml

Preoperative vitals like pulse rate, blood pressure, respiratory rate and oxygen saturation (SpO_2) were checked.

Monitoring was done for pulse rate, blood pressure, oxygen saturation and respiratory rate every 5 min. for first 30 min. and then every 10 min. thereafter till the end of surgery, after which patients were observed ½ to 1 hourly. All the observed data were tabulated and statistically analysed.

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RESULTS

The above table shows there was no statistically significant difference in the pulse rate (table 1).

Table 1: Changes in pulse rate at various time interval

Time interval	GR I (C)	GR II (D 8)	GR III (D 12)	GR IV (D 16)
Basal	72.9±6.81	74.8±6.44	70±4.87	69.9±5.47
5 min.	78±5.3	80±5.5	74±4.6	76±5.4
10 min.	82±2.5	84±5	80±4.4	77±5.5
15 min.	83±4.6	81±5.3	75±4.9	76±4.5
20 min.	78±4.7	80±4.9	74±4.4	75±3.5
30 min.	76±3.6	78±4.5	72±4.3	74±3.6
60 min.	76±3.4	77±3.1	72±4.6	73±3.5
90 min.	74±3.8	75±3.4	71±4.3	71±3.2
120 min.	74±5.1	75±3.4	71±4.0	71±2.7

Table 2: Changes in systolic blood pressure at various time interval

Time interval	GR I (C)	GR II (D 8)	GR III (D 12)	GR IV (D 16)
Basal	123±6.99	120±8.48	123±8.48	122±9.01
5 min.	112±7.9	113±7.8	113±7.3	106±26
10 min.	100±25	107±7.3	106±8.2	106±9
15 min.	108±6.9	103±8.2	109±8.1	100±25
20 min.	113±5.9	103±7.5	111±6.1	110±6.2
30 min.	116±6.2	106±8.7	114±5.4	110±18
60 min.	117±6.7	110±8.1	114±5.9	116±5.3
90 min.	120±5.1	115±6.9	117±5.4	104±35
120 min.	120±5.1	120±6.3	117±5.4	115±19

The above table shows there was no statistically significant difference in the systolic blood pressure in the four group (Table 2).

Table 3: Changes in diastolic blood pressure at various time

Time interval	GR I (C)	GR II (D 8)	GR III (D 12)	GR IV (D 16)
Basal	78.3±8.34	78.1±7.55	75.5±8.2	75.8±8.81
5 min.	73±7.2	72±14	72±7.1	74±7.4
10 min.	65±5.3	66±4.9	68±7.6	72±3.8
15 min.	67±4.8	67±4.8	70±7	71±4.2
20 min.	69±4.7	69±4.5	71±6.1	72±6.1
30 min.	70±4.9	71±5.2	71±6.5	73±4.7
60 min.	72±5.2	72±5.3	71±6.3	73±5.3
90 min.	72±5.2	74±6	72±5.4	75±5.5
120 min.	76±7.5	75±6.3	73±5.7	76±5.5

The above table shows there was no statistically significant difference in the diastolic blood pressure (table 3).

Table 4: showing changes in respiratory rate at various time

Time interval	GR I (C)	GR II (D 8)	GR III (D 12)	GR IV (D 16)
Basal	17.7±0.64	17.6±0.8	17.8±0.7	17.8±0.76
5 min.	18±0.7	18±0.8	18±0.6	18±0.5
10 min.	18±0.5	18±0.7	18±0.6	18±0.6
15 min.	18±0.7	18±0.6	18±0.7	18±0.7
20 min.	18±0.6	18±0.7	18±0.6	18±0.6
30 min.	18±0.7	18±0.7	18±0.7	18±0.6
60 min.	18±0.5	18±0.6	18±0.7	18±0.8
90 min.	18±0.7	18±0.5	18±0.6	18±0.7
120 min.	18±1.9	18±0.7	18±0.6	18±0.7

The above table shows there was no statistically significant difference in the respiratory rate (Table 4).

DISCUSSION

Glucocorticoids are well known for their analgesic, anti inflammatory, immune modulating and anti emetic effects. Several randomized clinical trails in many different major and minor surgical procedures have been conducted to examine the effects of a perioperative single dose of Glucocorticoid (Holte 2000).

Encouraged from the above facts,it was thought worthwhile to study and evaluate, single dose of I.V.dexamethasone for haemodynamic stability and postoperative analgesia in elderly patients to assess its admissibility in day to day clinical practice.

There was no significant difference in the pulse rate among all the four groups during the study (table 1). The pattern of pulse rate variation was almost similar in the study groups. Similar was the case with systolic (table 2), diastolic (table 3) and mean arterial blood pressure in all the four groups.

The mean respiratory rate was comparable among the patients in the four groups (table 4). None of the case showed any significant changes in respiratory rate. There was no clinical as well as statistically significant changes in respiratory rate.

No peri and post operative side effects in terms of delayed wound healing (Schulze 1997, Wicke 2000) implant infecton, nausea and vomiting, perineal irritation were observed in the present study till the patients were discharged from the hospital (Neff 2002, Perron 2003).

CONCLUSION

It can therefore be said that dexamethasone in dose of 16 & 12 mg. or may be higher is a valuable tool added to the armamentarium of the present day anaesthesiologist in combating postoperative pain as haemodynamic stability was maintained an all groups.

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