Effect of General and Spinal Anesthesia on Neuro-behavioral Responses in Cesarean Babies

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Anesthesia plays an important role in cesarean section (CS) specially in critically ill mothers. Opinion varies among anesthesiologists regarding using general anesthesia (GA) or spinal anesthesia (SA) in CS. GA provides superior ventilatory and circulatory conditions to mother and fetus while SA has no narcotic effect and the biochemical changes on fetus and mother are minimum.

Apgar score helps in assessing the immediate need for active resuscitation though the subclinical effect of drugs on the neurological behavior of the newborn remains undetected. This study was conducted to find out the effect of GA and SA on the neurobehavioral responses of babies born of CS by using Scanlon scoring system(1).

Material and Methods

This study was carried out in the Department of Anesthesia and Neonatology Unit of Pediatrics at the Mahatma Gandhi Institute of Medical Sciences, Sevagram. A total of 100 full term antenatal cases planned for elective CS were selected. Fifty full term neonates delivered vaginally served as the controls. Patients were investigated and selected on the basis of criteria laid by the Committee of American Society of Anesthesiologists(2) of ASAI (patient with no organic, physiological, biochemical or psychiatric disturbances).

Mothers having a repeat CS or finding suggestive of fetal distress were excluded. Mothers in the study group were divided randomly into two groups, each group of 50 receiving either GA or SA. These groups were matched in terms of maternal age and parity. Each mother was administered one litre of ringer lactate intravenously and left lateral tilt maintained till delivery of the baby. GA was induced by 2.5% pentathal sodium and maintained with nitrous oxide and oxygen (50 : 50) and 0.5% halothane. SA was induced with 1 ml of 5% xylocaine. Induction delivery (*i.e.,* duration between induction of anesthesia and delivery of baby) and uterine delivery intervals (*i.e.,* duration between incision over uterus and extraction of baby) were noted. After delivery, the baby's Apgar score was noted at 1, 5 and 10 min. All babies were shifted to the ward alongwith their mothers. Neurobehavioral responses of the baby were assessed to 12 and 24 h after delivery using the Scanlon scoring scale(1). The examination involved assessment of the state of wakefulness, reflexes, muscle tone and power, response to pin prick, light and sound. The grading of responses was O: absent or minimal; (1) weak; (2) borderline or delayed; (3) normal. Scores were interpreted as low (0-2) and high (3 and above). Statistical significance was calculated.

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Received for publication August 30, 1989; Accepted November 26, 1991

Results

All babies were full term and weighed between 2.3 and 4.0 kg (mean 2.8 ± 0.4). The maternal age ranged between 18 and 33 years (mean 20 ± 1.5) and parity 1 to 2 in both the study and control groups. The induction delivery interval in both the study groups ranged from 6-15 min, with the mean being 7.4 min in GA and 9.6 min in SA. The uterine delivery interval in both groups ranged from 50-110 sec; mean being 72.4 sec in GA and 66.8 sec in cases undergoing SA. The number of babies having high neurobehavioral scores at 12 and 24 h following delivery in different groups are shown in *Table I*. Though scores increased in all groups from 12-24 h, there were less babies with high scores in the GA group as compared to the control and SA groups. This difference was statistically significant ($p<0.05$). Except for response to sound and pinprik (same in all the 3 groups) all other nenurobehavioral responses were significantly depressed in the GA group. Feeding problems like difficult rooting and poor or ill-sustained sucking was seen in 30, 17 and 15 babies in GA, SA and control group, respectively; the difference between GA and SA was statistically significant ($p<0.05$).

Discussion

SA for CS has been used safely due to reduction in the chances of caval compression and hypotension by preloading with intravenous fluids and maintaining left lateral position during the operation(3,4).

Apgar score is inappropriate for predicting the delayed action of drugs on the neonatal behavioral reflexes(5). Hence, we adopted the Scanlon scoring system to assess the neurobehavioral state of the neonate stabilized at 12-24 h after delivery.

In our study, most scores (except response to sound and pinprick) at 12 and 24 h were significantly lower ($p<0.05$) in infants delivered by CS after GA as compared to SA. The rooting and sucking reflexes, being segmental medullery reflexes, were affected the most. Besides, scores based on muscle tone, overall assessment, alertness and Moro's response were also affected more after GA. Similar findings have been reported earlier(6). Although the induction delivery interval was slightly more in the SA group and the uterine delivery interval greater in the GA group, both intervals were within the normal range(6).

SA has proved its superiority over GA. The delayed effect of the anesthetic agents is negligible after SA, with little alteration in nuerobehavioral reflexes. It can be safely administered in premature delivery or in cases of fetal distress.

On the other hand GA should be reserved for emergency CS where patient refuses SA or has associated placenta previa, placental separation or eclampsia or in cases where there is failure to locate the epidural space or spinal fusion.

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Retinopathy of Prematurity—A Preliminary Report

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Retinopathy of prematurity (ROP) is a specific problem of the sick preterm neonate. With the advent of neonatal intensive care units and increasing survival of very low birth weight infants, there has been an increase in the incidence of ROP(1). Over the last decade, there has been an increased awareness of neonates and their problems in our country and a number of neonatal intensive care units have come up. With this and an increased survival of very low birth weight infants ROP must be occurring amongst this group of babies, but to date there is no literature on incidence of ROP in India. During the course of one year we screened 6 high risk babies for ROP of whom 5 had varying stages of ROP. These cases are presented in brief as a preliminary report.

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Received for publication June 28, 1991; Accepted January 16, 1992

Material and Methods

Six babies who weighed less than 1500 g and required intensive care and oxygen therapy were screened for ROP. None of these babies were on ventilatory support, all had hood oxygen therapy at a rate of 2-5 litres per minute and none of them had blood gas analysis or oxygen saturation monitoring. Oxygen therapy was started because of cyanosis, apneic episodes or because the baby looked sick. These infants were first examined at 3-4 weeks of age before discharge and a repeat examination was done at 6 weeks of age in the follow up clinic. Subsequent checkups were done at 2-3 weeks intervals and the frequency of examination was reduced to 1-2 months if there was no progression.

Mydriasis was achieved by using 1% phenylephrine and 1% tropimide in neonates less than 6 weeks and with 2.5% phenylephrine in babies more than 6 weeks. Atropine was not used for mydriasis because one of the our babies had developed atropine toxicity after using 1% atropine ointment(2). Examination was done under topical anesthesia using a binocular indirect ophthalmoscope. Staging (*Table I*) was done following the International Classification of ROP(3-5).

Results

Of the 6 babies screened 5 had ROP and in one infant the fundus was normal. One baby had stage I, 3 had Stage II and 1 had Stage III ROP. (*Fig.*). The babies with