NEUROBEHAVIORAL ASSESSMENT VERSUS APGAR SCORE IN CAESAREAN SECTION BABIES

By

P. K. Shah, A. R. Fernandez, S. V. Prabhu,
P. R. Vaidya and N. N. Munshi

SUMMARY

Twenty seven full term caesarean section babies having normal Apgar score ($\geqslant 8$) were assessed for neurobehaviour on the first, second and third days of life along with matched control group of full term normally delivered babies. Although Apgar score was normal, babies born by caesarean section showed C.N.S. depression. The cause of C.N.S. depression observed may be due to intrauterine hypoxia. General anaesthetic agents used in majority of cases also might be a contributory factor.

Introduction

There are limitations of conventional Apgar scoring system as shown by Singh (1985). This is because Apgar score assesses mainly the vital functions which are governed at the brainstem level, whereas it is well known that the cerebral cortex is the most important part of the brain as far as higher functions are concerned. Zrazelton (1984) and Scanlon (1979) have shown that only a complete neurobehavioral assessment can specifically take into account cortical functions like adaptation and discrimination. In the present era, the incidence of caesarean section has risen significantly. As all such operative delivery neonates are precious from the patients' future obstetric point of view, a thorough examination in the form of neurobehavioral assessment is more useful and sensitive index to assess neurological status of neonates as compared to Apgar score alone.

From: The Department of Obstetrics and Gynaecology and Department of Paediatrics L.T.M.M. College and L.T.M.G. Hospital, Sion Bombay-400 022.

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Material and Method

Twenty seven full term caesarean section babies having a normal Apgar score (> 8) were assessed for neurobehaviour on the first, second and third days of life. Control group of twenty seven full term normally delivered babies, matched for sex, birthweight, Apgar score and gestational age were similarly assessed on the first three days after birth. The conditions under which the babies were examined, were standardized for both the groups. All babies were examined by the same examiner every time and about one and a half hours after feeds. Table I shows the indications for caesarean section.

Twenty four patients were given general and 3 were given spinal anaesthesia. Twenty four were emergency and 3 were planned

TABLE I
Indications for Caesarean Section

Indication	No
Foetal Distress	7
Foetal Distress with Breech	4
Previous C.S. with C.P.D.	3
Previous C.S. with Breech	2
Previous C.S. with Prolonged Leaking	2
Previous C.S. with Foetal Distress	2
Placenta Praevia	2
Previous Two C.S.	1
Cord Prolapse	1
Failed Vacuum and Forceps	1
Accidental Haemorrhage	1
C.P.D.	1
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caesarean sections. Twenty patients were unbooked cases whereas 7 were booked ones,

Neurobehaviour was assessed as suggested by Scanlon (1974). For the state of awakening, score of —2 to +4 was given and for the rest of observations 0 to 3 score was given for both the groups.

Observation

As shown in Table II, 6 scoring indices were highly significant ('t' value 1.96 corresponding to P value of less than 0.05), or just significant ('t' value = 1.96 corresponding to P value of 0.05) on first day after birth, 3 indices were highly significant on second day after birth and only 1 index was just significant on the third day of life.

Discussion

Babies born by caesarean section showed significant level of Central Nervous System depression as judged by neurobehavioural assessment, although Apgar scores were normal. This depression was maximum on the first day and gradually decreased and was insignificant by the third day of life.

It is believed that caesarean section is an atraumatic delivery compared to vaginal delivery but one must keep in mind certain factors like indications for caesarean section itself, type of anaesthesia, delay in performing it, etc. as regards

TABLE II
Neurobehavioral Assessment Score

No.	Parameter	DAY 1		DAY 2		DAY 3	
		't' value	Significance	't' value	Significance	't' value	Significance
1.	State of Awakening	1.08	N.S.	1.72	N.S.	1.73	N.S.
2.	Decrement in response to light	1.96**	J.S.	0.48	N.S.	0.39	N.S.
3.	Pull to sitting	1.28	N.S.	1.11	N.S.	1.57	N.S.
4.	Truncal tone	1.97*	S.	0.60	N.S.	0.36	N.S.
5.	Arm recoil	1.78	N.S.	0.64	N.S.	1.01	N.S.
6.	General body tone	0.19	N.S.	0.12	N.S.	0.85	N.S.
7.	Rooting Reflex	1.99*	S.	1.17	N.S.	1.96**	J.S.
8.	Sucking Reflex	2.03*	S.	2.18*	S.	0.27	N.S.
9.	Moro's Reflex	2.26*	S.	2.10*	S.	1.68	N.S.
10.	Placing Reflex	2.94*	S.	3.49*	S.	1.75	N.S.

* P 0.05 = 't' value 1.96, **P = 0.05 = 't' value of 1.96.
N.S. = Not significant, S. = Significant, J.S. = Just significant.

the prognosis of the child is concerned. The findings of this study suggest that the babies born by caesarean section suffer from transient cortical or higher function depression as compared to babies born by vaginal deliveries. Probable reasons for central nervous system depression may be intrauterine hypoxia in most cases due to various indications for which the caesarean sections were performed. General anaesthesia used in majority of cases might also be a contributory factor.

General anaesthestic agents like Thiopental sodium and Nitrous Oxide cross the placental barrier and reach foetal circulation. This leads to central nervous system depression to some extent as shown by Hallman *et al* (1978). These agents are metabolised slowly from the foetus and therefore by third day of life, neuromuscular behaviour comes to near normal. In the present study no separate groups were studied between general and spinal anaesthesia because number of spinal anaesthesia cases is too small to be statistically significant. Study conducted by Hodgkinson *et al* (1978), Scanlon *et al* (1974) and Munshi *et al* (1985) earlier shows central nervous system depression following general anaesthesia.

Although the central nervous system depression recorded in our study was transient, it is vital in the period during which it occurs i.e. first three days of life, during which the maximum maternal-foetal bonding occurs as shown by Scanlon 1979. Therefore long term psychological effects on the baby due to critical period depression is required to be evaluated in future studies. Secondly this depression though transient might reflect future intellectual handicap. Thus neurobehavioural assessment in newborn in early neonatal life might help predictive value for mental handicap suffered by caesarean section babies with normal Apgar score as documented by previous studies by Hodgkinson *et al* (1978) and Munshi *et al* (1985).

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