

RETINAL HAEMORRHAGE IN THE NEWBORN

by

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As early as 1861 retinal haemorrhage in the newborn was identified by Jaeger. Since then many ophthalmologists have tried to assess the etiology, incidence and its significance regarding vision.

Varied etiological factors have been attributed for retinal haemorrhages, such as local causes resulting in asphyxia, increased intracranial pressure, pressure gradient, and influence of hormones. About a century ago Koenigstein (1881) felt that haemorrhage occurred during the first act of respiration. Later, Paul (1900) attributed it to a loop of the umbilical cord around the neck of the newborn. Ehrenfest (1922) postulated that the cause of haemorrhage was a pre-existing haemorrhagic diathesis, while Eades (1929) thought forceps delivery to be the cause. Increased venous pressure, especially in the cavernous sinus along with the fragility of blood vessels of the newborn as the cause of haemorrhage was first suggested by Schleich (1890) and later by Makeoun (1941) and Jain and Gupta (1965). Giles (1960) believed that haemorrhages occurred when there was a high pressure gra-

dient around the foetal head. Gajaria *et al* (1965) believed that hormones such as oestrogen and progesterone played a part in the production of haemorrhage. They thought oestrogen influenced the bleeding, particularly of the capillary type.

To find out the incidence of retinal haemorrhage and if any factors such as age, parity, prematurity, mode of delivery and duration of labour influenced the incidence, 250 mature and 100 premature babies delivered in the Lady Hardinge Medical College and Hospital were examined for retinal haemorrhages. Examination was made after dilating the pupils with 2-3 drops of 1% atropine. No difficulty was experienced in viewing the fundus after tightly swathing the baby with the arms extended by the sides. All infants were examined within the first hour of delivery. The maternal age, parity, duration of labour, type of delivery and weight of the newborn infant were recorded carefully. The findings in the premature group were utilised in assessing the influence of weight on the retinal haemorrhage. Infants of the mothers with associated diseases were not included in this study.

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Observations

Ophthalmoscopic observations

Retinal haemorrhage was seen maximum in the posterior pole of the

eye, mainly surrounding the disc, or between the disc and the macula. The macula was involved in a few cases only. In the majority of cases, the type of haemorrhage was superficial flame-shaped, either single or multiple. Some exhibited deep haemorrhages which were round and were about one or two disc diameter in size. Few presented sheet-like haemorrhages of deep red colour, mainly around the disc. In these, the haemorrhages were multiple and superficial and the fundus presented the characteristic sun-set appearance.

Our series did not show any subhyaloid haemorrhage.

Incidence

Out of a total of 350 cases under study, retinal haemorrhages were present in 147 new-borns, giving an incidence of 42%

Influence of Parity and Age

Out of 250 full term cases, there

were 90 primiparous and 160 multiparous mothers. The incidence was highest in the babies born in primiparas (45 or 50%) as compared to the babies born to multiparas (53 or 33.1%).

Table I shows the incidence in primiparas and multiparas quoted by various recent workers and the incidence in the present study.

Age seemed to play an important role in primiparas. The lowest incidence (33.3%) was seen in the age group of 20-24 years (Table II) which is statistically significant. In multiparous mothers variation in age had no significance.

Maturity of Infant

Retinal haemorrhages were detected in 108 (43.2%) out of 250 mature infants and in 39 out of the 100 premature newborns (39%). Thus, there was no significant difference in the incidence of haemorrhage in the mature and premature babies.

TABLE I
Incidence quoted by recent workers

Authors	Year	Incidence in primiparas	Incidence in multiparas
Giles	1960	45%	38%
Jain & Gupta	1965	36%	22%
Gajariaital	1965	34.4%	19.2%
Present series	1969	50%	33.1%

TABLE II
Age

Age group	No. of patients	No. in which haemorrhage was present	Percentage
15-19 years	30	21	70%
20-24 years	42	14	33.3%
25-29 years	10	6	60%
30-34 years	7	3	42.8%
40 years	1	1	100%
	90	45	50%

Mode of Delivery

Out of 250 full-term deliveries, 30 babies were delivered by forceps application; of these 10 or 33.3% had retinal haemorrhages. Spontaneous delivery occurred in 220 cases, out of which 98 or 44.5% babies had retinal haemorrhages. Further break-up of the spontaneous delivery cases revealed that out of 201 cases with proper control of delivery of the foetal head, 85 cases (42.2%) showed retinal haemorrhage, while out of 19 cases with poor control of delivery of the foetal head, 13 (68.4%) had retinal haemorrhages.

Duration of Labour

(a) *Spontaneous delivery*: The mean duration of labour was 12 hours and 40 minutes in mothers whose infants had retinal haemorrhage, while it was 9 hours and 45 minutes in those whose infants had no haemorrhage.

(b) *Forceps delivery*: The mean duration of labour was 28 hours and 51 minutes in mothers whose newborns had retinal haemorrhage and 19 hours and 43 minutes in mothers of newborns without haemorrhage.

Discussion

There is marked discrepancy in the incidence of retinal haemorrhage as can be seen from various reports. Differences in prenatal care, lack of vitamin K, method and time of examination have all been suggested as possible factors for the varied percentages. In many of the earlier reports, the time of examination is listed as "Shortly after birth". In other groups, the examination is reported as being done within 3 or 4 days. It has been observed (Giles, 1960) that

several haemorrhages absorb within 24 hours and many by 48 hours and all practically within a week of birth. In this series all infants were examined in the first hour of birth. This, therefore, probably is the cause of a higher incidence of retinal haemorrhage (42%) which is very close to the incidence quoted by Jain and Gupta (1965) who examined their cases within the first 6 hours of birth. The incidence was only 21.5% in the series of cases examined by Gajaria *et al* (1965) who mentioned that the examination was made within 24 hours of birth.

Although multiparity seems to have a favourable effect on the incidence of retinal haemorrhage when compared with the primiparous mothers, why some newborns are affected and not others in both series is not yet clear. The most likely factor in the production of retinal haemorrhage seems to be the increased intracranial pressure over a prolonged period, as is observed in the spontaneous as well as in the forceps delivery cases.

Not only a simple pressure, but a pressure gradient is an important factor with the sudden release of such a pressure at the perineum in uncontrolled delivery of the foetal head. The incidence of the retinal haemorrhage was highest (68.4%) in such cases, which is statistically significant. The least incidence of retinal haemorrhage was in the age group of 20-24 years, this being the most favourable age for perinatal survival (Stallworthy and Bourne 1966).

Maturity of the foetal head does not seem to play a part in the protection of intracranial vessels as far as

the retinal haemorrhages are concerned. It is postulated that the premature foetal head being smaller than the full-term head was not subjected to the same amount of pressure of the birth canal. Whether haemorrhages have any long lasting effect on the vision has to be seen by a long follow-up.

Conclusion

Multiple factors such as increased intracranial pressure and pressure-gradient, age of the mother, laxity of the birth canal, mode of delivery and duration of labour seem to play a collective role in the production of retinal haemorrhages in the newborn.

Summary

1. Fundii of 250 mature and 100 premature new-born babies were examined within the first hour of their birth.

2. Retinal haemorrhages were detected in 147 (42%) babies.

3. Incidence of retinal haemorrhage was 50% in babies born to primiparas and 33.1% in those of multiparous mothers.

4. The incidence was least in babies of primiparas between the ages of 20-24 years.

5. There was no appreciable difference in the incidence of retinal haemorrhage in the mature and premature newborns.

6. Mode of delivery and duration of labour seemed to have a positive effect on the incidence of retinal haemorrhage.

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