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RETINAL HEMORRHAGES IN THE NEWBORN*

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Very little has been written about retinal hemorrhages in the newborn since 1941. Although it may be of less importance than some of our major ophthalmologic problems, it seems justifiable to call attention to this condition from time to time.

Previous to 1941 there were several papers on the subject. Most writers have begun their discussion by referring to Ehrenfest's[1] monograph of 1922. All of the papers have been to some extent concerned with the cause of the condition. Eades[2] thought the duration of labor had little effect but that the use of forceps was a definite factor. Schleich[3] attributed hemorrhage in the retina of the newborn to asphyxia and venous congestion.

Jacobs[4] thought this unlikely, since there are relatively less hemorrhages in the retina following breech deliveries. Jacobs also was of the opinion that no ill-effects resulted from these hemorrhages; however, he did have one patient with amblyopia, who had more hemorrhages in the retinas at the time of birth than any other of his patients.

Sykes[5] noted a general but no definite relationship between retinal hemorrhage and signs of intracranial trauma. Rowland[6] warned that the use of pituitrin during labor might be a factor in causing retinal hemorrhage in the baby. Jacobs found retinal hemorrhages in one of three patients with hemorrhagic disease of the newborn.

Authors have found varying incidence of this condition from 10 to 46 percent of the cases. This variation seems to be due to case selection and time of examination after birth.

McKeown,[7] in a study of 498 newborn infants, found retinal hemorrhages in 42.1 percent during the first 48 hours after birth. He concluded that though there was no general agreement as to the exact cause of the hemorrhages, the main factor was believed to be congestion of the retinal veins, resulting from increased intracranial pressure brought about by the circumstances of labor.

Hemorrhages vary greatly in extent and appearance. They may occur anywhere in the fundus, though most of them are seen around the posterior pole. There may be a single flame-shaped lesion on the disc, at the disc border, or along the retinal vessels. On the other hand, the greater portion of the fundus may be covered with hemorrhages, which partly or completely cover the disc,

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including the macula. Grossly, there are four types of hemorrhages seen, as described by Richman.[8] The flame-shaped hemorrhages are by far the most common; next are the grossly round ones which are considered as being in the deeper layers of the retina, or possibly even in the choroid. They are bright red in color. Then there are some sharply circumscribed, perfectly round, deep-red hemorrhages. Occasionally one of these has a pinpoint white center. These occur rather infrequently and may occur anywhere, but I have seen at least a few of them in the macula. The fourth group consists of subhyaloid hemorrhages. These are seen quite infrequently.

I[9] reported the findings in 3,381 newborn less than 72 hours of age (nearly all under 48 hours) in 1941. The present presentation is a continuation of that study. The 1941 report included 2,915 ward patients and 466 from the private service of Dr. Roland Porter. This presentation includes 7,727 ward patients and 3,198 private patients of Dr. Porter.

Tables 1 and 2 are sufficient to indicate the relationship between the type of labor and the resultant retinal hemorrhages in the baby. These are taken from the 1941 report.

It is noted that in general the ward and private patients follow a similar pattern. There was no spectacular difference as the result of the duration of labor. It appears to me, however, that the very short and very long labors are more likely to result in retinal hemorrhages in the babies.

TABLE 1

RETINAL HEMORRHAGES IN RELATION TO TYPE OF DELIVERY: WARD PATIENTS

Type	No. of Cases	Hemorrhages	Percent
Normal primipara	562	115	20.4
Normal multipara	1,675	265	15.8
Low forceps primipara	363	84	23.2
Low forceps multipara	108	25	23.1
Mid & high forceps primipara	38	18	47.3
Mid & high forceps multipara	13	6	46.1
Breech	92	7	7.6
Podalic version primipara	2	2	—
Podalic version multipara	7	2	—
Cesarean section	55	4	—
Total	2,915	528	18.1

TABLE 2

RETINAL HEMORRHAGES IN RELATION TO TYPE OF DELIVERY: PRIVATE PATIENTS

Type	No. of Cases	Hemorrhages	Percent
Normal primipara	16	4	25.0
Normal multipara	78	13	16.6
Low forceps primipara	168	25	14.8
High forceps primipara	93	16	17.2
Mid & high forceps primapara	36	13	36.1
Mid & high forceps multipara	23	5	21.7
Breech	18	0	—
Podalic version	1	1	—
Cesarean section	33	0	—
	466	77	16.5

There was no relationship between the eye or eyes involved and the head presentation during labor. Toxemia of late pregnancy of the mother appeared to be a factor of some importance.

Prematurity is not a factor. Very few prematures reveal retinal hemorrhages. My observations agree with those of Sykes, that there is a general but no definite relationship between intracranial trauma and retinal hemorrhage in the newborn. The pediatricians have requested that they be alerted whenever a baby has any number of retinal hemorrhages. Hemorrhagic disease of the newborn appears to be an important factor in the cases involved. Rowland's warning concerning the use of pituitrin in the second stage of labor appears to be warranted. This drug is, however, used very sparingly and no significant number of observations is available.

In 1941 Pray, McKeown, and Pollard[10] observed that the incidence of retinal hemorrhages in the newborn was markedly reduced in infants of mothers treated with a vitamin K preparation during or prior to labor. Their results suggested that the reduction was greater when treatment was started before labor. In 1956, Nonna Pie-

trowa[11] suggested administration of vitamin K before delivery.

In this study a total of 7,727 ward patients were examined from 1931 to 1956, the number per year varying from 135 to 392, and the incidence of retinal hemorrhage in one or both eyes ranging from 14.1 to 25.2 percent with an average of 18.2 percent in different years. From 1937 to 1956, 3,198 private patients were observed, the number ranging from 94 to 244 per year and the incidence of hemorrhage in the retina varying from 8.5 to 24.0 percent in different years. For the 10,925 patients the average incidence was 17.7 percent.

A vitamin K preparation was given to all mothers when they arrived in the hospital (with few exceptions) from 1941 to 1947. During these years 2,134 ward and 1,481 private patients were seen with an incidence of retinal hemorrhage of 18.2 for the ward and 17.8 for the private patients; that is, about 18.0 percent for the entire group. There seemed to be little effect from the vitamin K as used in this manner. Perhaps it was given too late. Its use was discontinued entirely because of the increased incidence of phlebitis in the mothers.

I have always had a clinical impression that there is a relationship between the incidence of retinal hemorrhages in the newborn and the duration and severity of labor pains following rupture of the fetal membranes. This may be associated with greater pressure changes in the fetal circulation as the result of unequal pressure distribution. In addition, the counter-pressure of the fluid against the eyes and cranial fontanelles can conceivably cause pressure changes in the retinal vessels more rapidly and more markedly than when the membranes are intact. This is in accord with McKeown's observation that abnormalities of labor are an important factor.

To make careful observations on this problem would require a great deal of time and effort but it might well be productive of information of value to us, especially in connection with intracranial trauma. Follow-up studies for later signs of possible birth trauma might well be worth while. This also would require a great deal of time, effort, and money.

So far as the eyes themselves are concerned we have very little evidence that the hemorrhages result in any real harm. They absorb very rapidly. During these 26 years some of these patients have come under my care, but I have not been able to find one with amblyopia or any other defect, in whom I had seen retinal hemorrhages of any degree at time of birth.

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