Retinal hemorrhage is not uncommon in the newborn infant. It has been shown that a fairly long build-up of intracranial pressure and a rather sudden decompression of the fetal head are required for the appearance of ocular hemorrhage [1]. The purpose of this study was to investigate whether there is an increased risk of retinal hemorrhage in those infants delivered by vacuum extraction.

1 Methods and results

All women were cared for at the University Hospital of Jacksonville, and only normal, low-risk patients delivered at term were included in the study. Vacuum assisted deliveries were performed with an Equell Pump EUS model 17U at 50–60 mm Hg or Air-Shields Diapump, Model A at 50–60 mm Hg. Patients with abnormal labors or macrosomic infants were excluded, as were those requiring indicated midpelvic applications of the vacuum extractor. Control term infants of mothers with equal parity were chosen by matching with the next appropriate delivery. All infants were admitted to the normal newborn nursery immediately following delivery. The study and control groups were similar in maternal age, parity and gestational age. The physicians performing the deliveries were unaware of this study.

Thirty eight infants were examined within 72 hours following delivery. The ophthalmic examinations were carried out by fulltime neonatologists using a direct ophthalmoscope 15 minutes after dilating the eyes. Retinal hemorrhage was recorded as present or absent. Consent was obtained from the mother before her baby was examined.

A comparison of retinal hemorrhage, parity, and method of delivery is shown in table I. The overall frequency of retinal hemorrhage was 21.1% : 31.6% in the vacuum deliveries and 10.5% in the spontaneously delivered group. Eight infants had clearly documented retinal bleeds, six following a vacuum extraction, of which five patients were primiparous. All infants appeared normal during their nursery stay and were discharged with their mothers. Statistical analysis showed no significance between vacuum assisted and spontaneous delivery in this small number of patients (p-value 0.116,
with 95% confidence limits). In primiparous women there was significance indication that ocular hemorrhage may be more frequent in this category of patients (p-value 0.01227). In multiparous patients the difference was not statistically significant (p-value 0.5471).

2 Discussion

In the neonate retinal hemorrhage is a transient but easily detected and objectively assessable sign. Its incidence has been reported to be as high as 2.6% [3]. Although many hypotheses have been suggested to explain the pathophysiology of retinal hemorrhage, the exact mechanism of this phenomenon is still not clear. It has been assumed that the neonatal retinal hemorrhage could be a result of changes in the intracranial venous pressure; some studies indicate that both a fairly long build-up of intracranial pressure and a rather sudden decompression of the fetal head are required for the appearance of ocular hemorrhage [2, 3]. Another hypothesis is that the vacuum extraction may cause a temporary impairment of blood flow in the sagittal sinus and the bridging veins, leading to venous stasis and bleeding in the retina. When compared to outlet forceps delivery the incidence of ocular hemorrhage is higher in the vacuum group. The forceps may minimize the pressure on the fetal head by a protective “helmet” function.

In a review of 201 cases of vacuum extraction compared to forceps, WIDER [4] observed an overall increased risk to the fetus. He also noticed lower Apgar scores with the indicated vacuum extraction as compared to the indicated forceps delivery.

An association between vacuum extraction and subclinical cerebral lesion has been described [2]. A much greater frequency of retinal hemorrhage has been reported with the vacuum extractor [3]. The results reported here, although small in number, are confirmatory. No verifiable relationship has been found between retinal hemorrhages and obvious brain damage. The question is whether this type of bleeding may be associated with a subclinical cerebral lesion which may appear later in life. Indications for such as association between vacuum extraction and subclinical cerebral lesions have been referred to in studies using physiologic, radiologic and electroencephalographic studies, but analysis of the development quotient of infants up to 18 months were not correlated with the occurrence of retinal hemorrhage [2]. Other authors who examined the ocular findings of infants at age 1 to 6 years could not find any correlation between the presence or absence of retinal hemorrhage at birth and subsequent ophthalmologic development [3].

Although the pathophysiology of retinal hemorrhage with the vacuum extractor does not exist, a temporary impairment of the sagittal sinus and bridging veins leading to retinal stasis and hemorrhage is very acceptable. The occurrence of bleeding in other areas needs to be evaluated. Future reports will require grading of the severity of the hemorrhage, CAT scans, and careful matching of the control and study group.

Summary

The purpose of this prospective study was to investigate whether there is an increased risk of retinal hemorrhage in those infants delivered with the assistance of the silastic vacuum extractor from mothers who were low-risk and who had normal labors. Ocular fundi of 38 term newborns (19 vacuum assisted deliveries, 19 spontaneous deliveries) were examined for retinal hemorrhage within 72 hours after delivery. The overall frequency of retinal hemorrhage was 21.1%, 31.6% with the vacuum extractor and 10.5% with a spontaneous delivery. The mode of delivery did influence the number of infants with hemorrhages in each category, however this was only statistically significant in primiparous patients. The prognostic significance of the degree of retinal hemorrhage was not assessed.

Keywords: Retinal hemorrhage, vacuum extractor.
Zusammenfassung

Retinablutung und Vakuumextraktion

Schlüsselwörter: Retinablutung, Vakuumextraktion.

Résumé

Hémorragies retiniennes et extraction par ventouse
Le but de cette étude prospective était de rechercher s'il y a un risque accru d'hémorragie rétinienne chez les enfants extraits à l'aide de ventouse en silastic chez les mères à bas risques et ayant eu un travail normal. On a examiné le fond d'œil de 38 nouveaux-nés à terme (19 avec ventouse et 19 naissances spontanées) à la recherche d'hémorragies rétiniennes au cours des 72 heures suivant l'accouchement. La fréquence globale des hémorragies rétiniennes est de 21,1%, 31,6% avec la ventouse et 10,5% pour l'accouchement spontané. Le mode d'accouchement influence le nombre d'enfant ayant une hémorragie dans chaque catégorie, cependant ce fait n'est significatif sur le plan statistique que chez les primipares. La signification pronostique du degré d'hémorragie rétinienne n'a pas été estimée.

Mots-clés: Hémorragie rétinienne, ventouse.

References


James A. O'Leary, M. D.
655 West Eighth Street
Jacksonville, Florida 32209, U. S. A.