

perinatally transmitted acute icteric hepatitis B in infants born to B e antigen negative, B e antibody positive mothers, two of Asian and one of Caucasian origin.³

Delaphane *et al*⁴ reported from Chicago on three fatal cases of hepatitis B in infancy, all born to hepatitis B surface antigen positive mothers, one of whom was B e antibody positive. It is suggested that infants born to B e antibody positive mothers have a normal immunological response which may cause hepatic damage.

Studies have recently shown that passive administration of hepatitis B immunoglobulin may be insufficient to protect children from a lifetime risk of exposure.⁵ It is suggested that hepatitis B immunoglobulin be given to the baby for initial protection and, at the same time, vaccine for long term protection from an active immune response. If serological tests at 12 to 15 months detect hepatitis B surface and e antibodies there has been successful passive/active immunisation. On the other hand the presence of B surface antigen at 12 to 15 months reflects failure of the prophylactic regimen.

If the mother of the baby described in this case had been identified antenatally as hepatitis B e antibody positive this would have led to exclusion of her child from immunoprophylaxis.⁶ It would be

appropriate therefore to give immunoprophylaxis to all infants born to B surface antigen positive mothers and not only to those found to be B e antigen positive.

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Scalp changes after fetal monitoring

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SUMMARY We prospectively studied 535 newborn infants who had been monitored during labour with scalp electrodes. Daily examination of scalp changes showed frequent transient mild lacerations, while severe complications were rare: seven (1.3%) had scalp ulceration and one (0.2%) developed scalp abscess.

Fetal heart monitoring during labour is now used in nearly all obstetric units to improve perinatal outcome. Several reports have described complications after the application of the scalp electrodes.¹⁻³ The whole spectrum of neonatal scalp changes associated with fetal monitoring, however, and their precise incidence have not as yet been described. We undertook a prospective study with daily ex-

amination of scalp changes in all newborn infants monitored during labour, and describe their incidence, clinical spectrum, and factors associated with severe complications.

Patients and methods

Study patients. All the infants delivered at the Beilinson Medical Center between 1 August, 1982 and 16 October, 1982 who had direct fetal heart rate monitoring during labour were included in the study. Of the total 660 live births during that period, 535 (81.1%) were monitored by scalp electrodes, and these infants comprised the study group. The 1513 OA fetal monitoring spiral electrodes (Hewlett-Packard Company USA) were used in our patients.

Methods. Direct fetal monitoring was performed

routinely, except when electrodes were unavailable. The time of the application of the electrodes and the course of delivery were precisely documented. In the nursery the scalp was carefully examined during the first day of life by one of us (SA). Daily observations of the site of electrode application were continued by the same physician until discharge from the hospital at the age of 72 to 96 hours. Neonates with scalp abscess or ulcer were followed after discharge in the Paediatric Dermatology Clinic by one of us (AM). Scalp changes were classified into four grades of severity: grade 0—no scalp pathology other than punctures caused by the electrodes; grade 1—transient superficial laceration, healed before discharge; grade 2—superficial laceration present at discharge; and grade 3(a)—scalp ulcer and (b) scalp abscess. When lacerations were found the hair around them was shaved and an antiseptic solution (chlorhexidine 3%) used to clean the area.

Statistical analysis. Data on the obstetric history, course of delivery, and the status of the newborn infants was collected, computerised, and analysed. The χ^2 test of independence and the Student's *t* test were initially used for the statistical univariate analysis. Factors significantly associated with severe scalp changes were further analysed using multivariate analysis.

Results

Twelve infants (2.2%) were preterm, 22 (4.1%) were of low birthweight (less than 2500 g), and 99 were born after high risk pregnancies (including meconium stained amniotic fluid, prolonged rupture of membranes (greater than 24 hours), twins, fetal distress, prematurity, abnormal presentation, and induction of labour for any reason). Boys comprised 50.1% of the group. The mean duration of fetal monitoring was 4.6 hours and the range 0.5 to 19 hours. In 48 patients (9%) more than one application (two or three) of the electrodes was used.

Scalp changes (grades 1–3) other than the two punctures of the electrodes were seen in 221 newborn infants (41.3%) (see Table). In most,

however, (113, 51.2%) we observed only minor transient lacerations, healed at discharge from the hospital. Another major group (100 neonates) had mild lacerations, persisting when discharged from the hospital. Severe complications were observed in eight infants: seven (1.3%) had a scalp ulcer and one (0.2%) developed a scalp abscess. Follow up of the ulcerated cases in our clinic showed uneventful healing, with superficial scar formation and a small size alopecia after the age of 3 months.

The statistical analysis showed two important factors of which duration of monitoring was the most significant ($P=0.0001$). Sixty seven infants (12.5%) were monitored for less than four hours and none developed scalp abscess or ulcer. On the other hand, the incidence of these severe complications was 1.3% in 445 infants (83.2%) who were monitored for four to 12 hours, and 8.7% in 23 infants (4.3%) who were monitored for 12 hours or more.

Parity was the second factor, which independently significantly affected the severity of scalp changes ($P=0.0295$); 194 mothers (36.6%) had their first delivery and this was associated with a slightly increased incidence of grade 3 scalp changes.

Prolonged rupture of membranes was initially significantly associated with severe scalp changes using univariate analysis. Multivariate analysis indicated, however, that the effect was related to the increased duration of monitoring in these deliveries.

Discussion

This prospective study shows that neonatal scalp changes were found in 41.3% of the infants monitored during labour. Most, however, were only minor lacerations, while scalp ulcers and abscesses were rare. The occurrence of scalp ulcer as a complication of fetal monitoring has not been previously reported, but it is usually benign and can easily be missed or neglected. The lacerations and ulcers are probably caused by mechanical trauma to the scalp, which can be serious if the electrodes are removed by abrupt rupture, rather than slow easy spiral movement. Follow up of our older patients who had these ulcers showed that the scar tissue flattened, but residue of hypopigmentation and small alopecia are evident even after years, and can be later mistaken for congenital cutis aplasia. The incidence of scalp abscess after monitoring in the only prospective study performed was 4.5%,³ which is much higher than ours. It is possible that daily examinations with early diagnosis of minor lacerations and erosions and their local treatment prevented the development of scalp abscess. Indeed,

Table Scalp changes after intrapartum monitoring in 535 newborn infants (grades are defined in the text)

Grade	No of neonates	%
0	314	58.7
1	113	21.1
2	100	18.7
3a	7	1.3
3b	1	0.2

Mazzi *et al*⁴ showed that local treatment lowered the incidence of scalp abscesses in their hospital.

We found that only two factors were significantly associated with severe scalp changes. Duration of monitoring was the most important factor and the second was parity. First delivery was associated with an increase in severe complications, even after the duration of monitoring was controlled by multivariate analysis. It could be that during the first delivery, which is usually longer, the scalp is more prone to oedema and tissue hypoxia, which contribute to severe scalp changes. It also may well be a chance finding. Okada *et al*⁵ found that duration of monitoring and 'high risk indication for monitoring' (especially prematurity) were associated with scalp abscesses. We believe that the severe complications of fetal monitoring are partially preventable. Strict aseptic technique on application of the electrodes is important, as is electrode removal, which should be done with slow spiral movement. Local treatment of

small lacerations by shaving the hair and application of antiseptic solution is recommended.

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Carcinoid syndrome: an unusual cause of diarrhoea

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SUMMARY A 9 year old girl underwent laparotomy because of intermittent diarrhoea, present since infancy. Histology of a mass at the head of pancreas and multiple hepatic nodules suggested an apudoma. Plasma serotonin and urinary excretion of 5 hydroxy indole acetic acid were raised. The child is asymptomatic four years after diagnosis.

The past decade has seen major developments in the understanding of endocrine tumours of gut (apudomas) and the related clinical syndromes resulting from excessive secretion of gut hormones.¹ Apudomas may be classified¹ into those containing enterochromaffin cells (secreting serotonin, substance P, histamine, kallikrein, motilin, prostaglandin, and kinin) and non-enterochromaffin cells (secreting gastrin, glucagon, insulin, somatostatin, and vasoactive intestinal polypeptide). Resultant hypersecretory syndromes including gastrinoma, vipoma, glucagonoma, somatostatinoma, and carcinoid syndrome are rare and still scarcely considered in the differential diagnosis of childhood diarrhoea.

Case report

A 9 year old girl, the second child of healthy unrelated Scottish parents, presented with intermittent watery diarrhoea which she had suffered since the age of 5 months. A physical examination at 11 months had shown no abnormality. Passage of loose watery stools continued at three to four weekly intervals, but the patient thrived.

Despite three admissions to hospital for investigation of paroxysmal abdominal pain and diarrhoea at 6, 8, and 9 years, no abnormality could be found; nor did she suffer diarrhoea during several weeks in hospital. Abrupt mood changes were noted but although a psychiatric opinion was sought no abnormality was found.

Six months later the patient was again admitted to hospital with attacks of colicky abdominal pain, six to eight times daily, relieved by passing a brown watery stool. There was frequent vomiting and weight loss, her height and weight were on the third centile, and there was generalised wasting. The abdomen was distended and hyperresonant, the liver was 2 cm below the costal margin, and a 4 × 4 cm epigastric mass was palpable.