CONGENITAL PARALYTIC ILEUS IN A PREMATURE BABY AS A COMPLICATION OF HEXAMETHONIUM BROMIDE THERAPY FOR TOXAEMIA OF PREGNANCY

BY

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The increasingly frequent use of the ganglionic blocking agents in the treatment of hypertensive states makes it essential that all toxic effects be reported so that the dangers may be given due consideration. This case of paralytic ileus in a premature baby after the mother had been treated during pregnancy with hexamethonium bromide is therefore reported. To the best of our knowledge only three cases in newborn babies have been recorded (Morris, 1953).

The Mother

Mrs. G., a primigravida aged 32 years, was admitted to hospital on September 3 during the thirtieth week of pregnancy. She had severe pre-eclampsia. Table 1 is a summary of the clinical findings during the preceding weeks of pregnancy.

<table>
<thead>
<tr>
<th>Date</th>
<th>Weight (lb. oz.)</th>
<th>Blood Pressure (mm. Hg)</th>
<th>Albumin in Urine</th>
<th>Oedema</th>
<th>Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before pregnancy</td>
<td>154</td>
<td>120/80</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>15th week</td>
<td>169</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>19th week</td>
<td>172 8</td>
<td>118/80</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>25th week</td>
<td>179 8</td>
<td>140/88</td>
<td>Trace</td>
<td>Slight (fingers)</td>
<td>—</td>
</tr>
<tr>
<td>27th week</td>
<td>179</td>
<td>140/88</td>
<td>Trace</td>
<td>Slight</td>
<td>Insomnia</td>
</tr>
<tr>
<td>28th week</td>
<td>179 14</td>
<td>150/100</td>
<td>Trace</td>
<td>SLight</td>
<td>—</td>
</tr>
<tr>
<td>Given phenobarbitone, gr. ½ b.d., and instructed to rest in bed</td>
<td>181 4</td>
<td>150/100</td>
<td>Cloud</td>
<td>Feet and hands</td>
<td>—</td>
</tr>
<tr>
<td>29th week</td>
<td>184</td>
<td>180/108</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>30th week</td>
<td>184</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>(34 weeks)</td>
<td></td>
<td></td>
<td>—</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

After admission she was treated in bed at complete rest. Sedation, ammonium chloride, and a short course of 'veriloid' produced no appreciable improvement. The blood pressure on September 17, 1953, i.e., at 31½ weeks, was 170/118 mm. Hg and in addition there was generalized oedema of the limbs, body and face, and 2 g. albumin (Esbach) in the urine. Accordingly, it was decided to start a course of hexamethonium bromide. A test dose of 25 mg. was given subcutaneously and followed by 50 mg. subcutaneously six hourly.

Table 2 summarizes the patient's condition during the following two weeks.

<table>
<thead>
<tr>
<th>Date</th>
<th>Blood Pressure (mm. Hg)</th>
<th>Urinary Albumin (mg. Esbach)</th>
<th>Oedema</th>
</tr>
</thead>
<tbody>
<tr>
<td>17.9.53 (31½ weeks)</td>
<td>170/118</td>
<td>2</td>
<td>+++</td>
</tr>
<tr>
<td>20.9.53</td>
<td>176/120</td>
<td>2</td>
<td>+++</td>
</tr>
<tr>
<td>25.9.53</td>
<td>160/114</td>
<td>3</td>
<td>+++</td>
</tr>
<tr>
<td>30.9.53</td>
<td>158/108</td>
<td>3</td>
<td>+++</td>
</tr>
<tr>
<td>4.10.53</td>
<td>140/100</td>
<td>4</td>
<td>+++</td>
</tr>
</tbody>
</table>
pharynx and stomach, and with the baby nursed head
down liquor continued to trickle out for a further
half-hour.

Thereafter, the baby was transferred to the Premature
Baby Unit and nursed in an ‘isolette’ incubator. The
baby’s condition was now fairly good, though the cry
was poor, and there remained slight generalized cyanosis.

Day 2. The general condition had improved, but the
baby was still lethargic. Generalized oedema of the
limbs developed and lasted for a week.

Day 3. The abdomen was distended, and the skin
around the umbilicus was slightly red. Suspecting an
early umbilical infection, treatment with intramuscular
penicillin and soluthiazole was begun. That afternoon,
the first glucose water feed was given. Later the baby
vomited a brown mucoid material.

Day 4. The first meconium stool was passed. The
baby’s general condition and state of hydration remained
good. The baby was fed on diluted breast milk, but
feeds were stopped in the evening on account of gross
abdominal distension and 1 in 5 normal saline was
injected subcutaneously to maintain hydration.

Day 5. The abdominal distension had increased, and
a very resonant percussion note could be elicited over the
entire abdomen. A stomach wash-out was performed,
and gastric flatus and some brown material similar to
that vomited on the third day were removed. After the
wash-out the abdominal distension diminished con-
siderably, though only temporarily.

That evening, a bowel wash-out with half normal saline
produced a black cast of inspissated meconium, approximately 3 in. long and ½ in. in diameter.

Day 6. Abdominal distension was still gross, although
a very small meconium stool had been passed sponta-
neously during the night. Radiographic screening
showed gross gaseous distension of the entire gut
without signs of organic obstruction. Peristalsis, while
present, was only sluggish.

Small tube feeds were begun again and later in the
day tube feeding was replaced by bottle feeding as the
baby began to suck.

Day 7. No change.

Day 8. The baby vomited twice only. Abdominal
distension continued. The baby was placed in a sitting
position and kept like that for the next two days but
with little noticeable effect. The stools became larger
and greener. It was not until the thirteenth day that the
first ‘changing stool’ appeared. Feeds were being
retained but the abdomen remained distended.

Day 13. Abdominal distension began to diminish.
The haemoglobin was 14·0 g. %. A transfusion of
30 ml. whole blood was given.

Days 16-21. The baby became far more active, stools
were assuming a more normal appearance, and a gain
in weight was recorded. On the twenty-first day an
entirely normal stool was passed and since then there
has been an uninterrupted gain in weight and apparently
normal development.

Discussion

The toxic effects of hexamethonium bromide are
numerous, ranging from symptomatic discomfort,
such as blurring of vision, dry mouth, constipation
(Morris, 1953; Mackey and Shaw, 1951; Turner,
1950) to attacks of postural hypotension, resulting
in cerebral thrombosis and cerebral haemorrhage
(Hirson and Kelsall, 1951) and fatal paralytic ileus
(Bourne and Hosford, 1951).

The effects on the foetus and newborn infant in
motoxaemic mothers has been studied by Young
(1952), Mulcahy (1952) and Morris (1953). Turner
and Mulcahy reported that they observed no
harmful effects on the newborn baby, but Morris
reporting on the use of hexamethonium bromide in
10 motoxaemic mothers reported complications in
three and possibly four of the issue. Two babies
died with symptoms of paralytic ileus. There was
a 20-hour delay in the passage of the first meconium
stool in the third baby, and a fourth died with wide-
spread purulent bronchopneumonia which Morris
suggested may have been due to reduced bronchial
secretion favouring respiratory infection. In his
tenth case he studied the liquor levels of hexa-
methonium bromide in an anencephalic monster.
He found that there was a rise in the liquor in the
liquor, which continued even after administration of
the drug was stopped, and suggested that this proved
the excretion of the drug in the foetal urine. (How-
ever, since an anencephalic monster cannot swallow
(Taussig, 1927) the theory that the drug normally
concentrates to the degree he quotes is open to
serious doubt.)

Young (1952) has studied hexamethonium bro-
mide levels in pregnant rabbit does and showed free
passage of the drug across the placental barrier.
The drug persisted in the liquor for many days after
the last dose had been given. It is probable, there-
fore, that in the case recorded here the continued
administration of the hexamethonium bromide to
the mother to the time of the caesarean section had
resulted in a high foetal blood level of the drug.
This in turn had caused lethargy and paralytic
ileus, the symptoms of which abated as the drug
was excreted from the baby’s body.

Morrison and Paton (1953) studying the effects
of parenteral administration of hexamethonium
bromide on normal individuals in relation to its
concentration in the plasma, found that 'the drug is evenly distributed throughout the extracellular fluid' and that their calculations were 'compatible with its excretion by glomerular filtration'. This would explain the prolonged symptoms in the case recorded here since glomerular filtration in premature babies is very poor (Young, Hallum and McCance, 1941). The oedema neonatorum occurring in this baby would also support this hypothesis (Hallum, 1941).

McMichael (1952) states that vomiting and paralytic ileus seem more likely to occur when hexamethonium bromide is given orally. The fact that the foetus is constantly swallowing its own liquor would explain why this baby developed paralytic ileus while the mother, who was receiving hexamethonium bromide parenterally, had no disturbance of gastro-intestinal function. Details of the mother's history will be recorded elsewhere, but it may be mentioned here that on the day following the caesarean section she had a severe hypotensive attack following a dose of 50 mg. of hexamethonium bromide.

Summary

A case is recorded of transient paralytic ileus of congenital origin following treatment of the mother with daily doses of hexamethonium bromide (50 mg. q.i.d.) for 18 days up to and including the time of delivery of the baby. The baby failed to pass an appreciable quantity of meconium until a bowel wash-out was done on the fifth day. Peristalsis was diminished and there was gaseous distension of the entire gut lasting from shortly after birth until the third week of life. The character of the stools changed only during the second week, and normal size and consistency was assumed only at the end of the third week.

We are grateful to Dr. V. Mary Crosse in whose unit this baby was treated, and to Dr. L. M. Masterman who saw the baby in her absence. We also thank Dr. Astley for screening this baby.

REFERENCES

—— (1951). Ibid., 1, 408.