blood chemistry and absence of changes in the skull(5).

Although various measures like prednisolone, oral buffered phosphates and enzyme replacement therapy have been tried in this disease, there is no well established therapy(4,6). Death in the perinatal form occurs either in utero or few hours or at the most a few days after birth due to marked inability to ventilate the lungs properly in such patients(7). The unusual survival in the present case may have been due to the absence of severe involvement of the thoracic cage in the rachitic process.

REFERENCES


Neonatal Adrenal Hemorrhage

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The relatively large size and vascularity of the neonatal adrenal gland makes them vulnerable to traumatic and asphyxial injuries, with incidence of adrenal hemorrhage at necropsies being 1.7 per 1000(1). Though the exact cause of neonatal adrenal hemorrhage (NAH) is unknown, postulated etiologies include maternal diabetes, obstetric trauma, asphyxia, thrombocytopenia and coagulation defects(2,3). Our recent encounter of four patients with NAH who were evaluated by ultrasound(USG) prompted this report. USG which is a safe, portable, noninvasive, accurate, useful tool for the diagnosis of NAH, was the only imaging modality employed for diagnosis and follow-up of our cases.

Case Reports

From June to November 1990, four male neonates with mean birth weight of 3450 g presented with a flank mass in the

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first four days of life. All were term vaginal deliveries, except case 4 who was a preterm infant of a diabetic mother (IDM). Their salient features are summarized in the Table. Both neonates with birth asphyxia (Cases 2 and 4) had leucocytosis, of which the IDM also had hypoglycemia. Two had icterus within physiological limits and one had a ventriculoseptal defect with congestive cardiac failure (Case 3). Urine, hematocrit, clotting time, platelet count, prothrombin time, partial thromboplastin time were normal in all. USG abdomen showed a well defined suprarenal mass suggestive of NAH with a normal ipsilateral kidney in all. Follow-up revealed complete clinical and USG resolution within four months.

In all cases a tender flank mass, three on the right and one on the left, was detected on routine clinical examination within the first four days of life. Abdominal USG showed a well defined mass situated above the superior pole of a normal ipsilateral kidney, extending lateral to the kidney in two. In Cases 1 and 3, a predominantly hypechoic solid lesion (Fig. 1) was suggestive of neuroblastoma. Serial USG in these two cases showed regression of mass with total resolution which confirmed this lesion to be NAH. The other two masses had heterogenous solid cystic echotexture. Follow-up within 30 days showed regression of lesion in all patients, with change to a cystic echotexture (Fig. 2). Complete regression was seen by 120 days in all, with normal adrenal configuration but with calcification in two (Cases 3 and 4). No other radiological investigation was done.

**Discussion**

NAH occurs most frequently between the second and seventh postnatal day. In the present series all four cases were detected within the first four days. Almost

<table>
<thead>
<tr>
<th>Case No.</th>
<th>Birth weight (g)</th>
<th>Salient clinical features &amp; investigations</th>
<th>Ultrasound findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3500</td>
<td>Tender Rt. flank mass PCV—0.60 Blood sugar—72 mg/dl Indirect serum bilirubin—123 μmol/L</td>
<td>Day 5: Solid hypechoic mass (4.8 × 4.2 cm) Rt. suprarenal area, Rt. kidney normal Day 14: Lesion smaller, predominantly cystic Day 120: Lesion regressed completely</td>
</tr>
<tr>
<td>2</td>
<td>3400</td>
<td>Tender Rt. flank mass, seizures WBC—28 × 10⁹/L USG skull—normal Blood sugar—75 mg/dl Indirect serum bilirubin—160 μmol/L</td>
<td>Day 8: Mixed hypechoic predominantly cystic mass (3.9 × 3.8 cm) Rt. suprarenal area Rt. kidney normal Day 100: Lesion regressed completely</td>
</tr>
<tr>
<td>3</td>
<td>3400</td>
<td>Tender Lt. flank mass, VSD PCV—0.52 Blood sugar—60 mg/dl Indirect serum bilirubin—208 μmol/L</td>
<td>Day 4: Mixed hypechoic predominantly solid mass (5.2 × 4.6 cm) Lt. suprarenal area Day 30: Mass smaller, predominantly cystic Lt. kidney normal Day 120: Suprarenal dense echoes, posterior acoustic shadow indicating calcification</td>
</tr>
<tr>
<td>4</td>
<td>3500</td>
<td>Tender Rt. flank mass, bruises lower abdomen WBC—21 × 10⁹/L PCV—0.46 Blood sugar—25 mg/dl Indirect serum bilirubin—144 μmol/L</td>
<td>Day 7: Heterogenous predominantly cystic mass (3.3 × 3.3 cm) Rt. suprarenal area Rt. Kidney normal Day 14: Mass smaller, cystic echoes Day 100: Suprarenal dense echoes, posterior acoustic shadow indicating calcification</td>
</tr>
</tbody>
</table>

PCV—Packed cell volume; VSD—Ventricular septal defect; WBC—White blood cells.
supplying the left adrenal with alternative drainage channels in event of fluctuations in IVC pressure occurring during delivery. In our series three had right sided NAH. Large neonates who undergo abdominal compression and consequently increased IVC pressure during vaginal or stressed delivery are at greater risk of developing NAH.

The diagnosis of NAH is often difficult. It is important to distinguish it from renal vein thrombosis in which there is a variable degree of hematuria and proteinuria which were not noted in our cases. Small to moderate unilateral adrenal bleeds are usually asymptomatic as in our series. Large unilateral or bilateral extensive bleeds may occasionally present with jaundice, anemia, hypoglycemia, shock and adrenal insufficiency none of which were observed in this series. Preponderance of subcapsular hemorrhage explains the rarity of Addisonian crisis in NAH.

Before USG was introduced various invasive and expensive procedures were utilized for the diagnosis and follow-up of NAH. In our cases the initial diagnosis as well as the follow-up was by USG. A fresh clot following active bleeding is visualized on USG as a hyperechoic solid mass which may closely resemble neuroblastoma as in Cases 1 and 3. The cystic appearance of liquified NAH with or without low level echoes, should be distinguished from adrenal abscess, neonatal urinoma, cortical renal cyst and cystic neuroblastoma. Later, calcification in the resolved hematoma leads to a bright echogenic gland with posterior shadowing as in Cases 3 and 4. Treatment depends upon the severity of illness; blood, intravenous fluids and hydrocortisone may be required in large bleeds to combat shock and Addisonian crisis.
Judicious re-examinations documenting the sequential changes in echogenicity within the hematoma with its ultimate resolution is virtually diagnostic of NAH and prevents unnecessary, expensive and invasive investigations and surgical intervention. USG has hence become the modality of choice both for the initial diagnosis and clinical follow-up of these lesions(6).

REFERENCES


Kala Azar – Diagnostic Dilemma

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There has been sudden resurgence of kala azar in recent times. Most of the chil-
dren present no difficulties in diagnosis. However it is important to be aware of atypical clinical manifestations, leading to diagnostic problems. Three cases being reported illustrate the diagnostic difficulties, atypical hematological features, and rare complications in kala azar.

Case Reports

Case 1: A 12-year-old girl presented with fever, headache, altered sensorium, and cough with expectoration of five days duration. Examination revealed a malnourished and toxic child. Other signs were moderate pallor, generalized lymphadenopathy, bilateral fine crepitations on chest examination, no hepatosplenomegaly, and meningeal irritation with no neurological deficit. Investigations showed the level of hemoglobin 10 g/dl, total leucocyte count 11700/cu mm, with polymorphs 84%. The blood and sputum cultures were sterile, and the X-ray chest showed bilateral non homogeneous opacities suggestive of bronchopneumonia.

Management included ampicillin (100 mg/kg/day) and gentamicin (5 mg/kg/day). At the end of three weeks, the child continued to be febrile; clinical and radiologic signs of lower respiratory tract infection persisted. On empirical grounds a therapeutic trial with anti tubercular drugs was started. At the end of fifth week of

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