SEVERE HYPERNATRAEMIA IN A VERY PRETERM INFANT

Pages with reference to book, From 176 To 177

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SUMMARY

Hypernatraemia in very low birth weight babies has been well documented[1] and is usually attributable to excessive insensible water loss. We report a case in which, despite a peak serum sodium concentration of 204 mmol/l, the baby survived without morbidity. Treatment was simply to increase the intake of free water in Dextrose.

CASE REPORT

A baby girl of 620g birth weight and 24 weeks gestation was born by normal vaginal delivery to a 29 year old previously healthy mother. The baby received intermittent positive pressure ventilation at birth and assisted ventilation thereafter. She was commenced on an infusion of 60 mls/kg/24 hours of 10% Dextrose solution. She was also started on intermittent phototherapy at 30 hours of age because the serum bilirubin was 124 umol/l (7.Smg/dl). At 40 hours of age she appeared clinically dehydrated and was given 10 mls fresh frozen plasma. Her serum sodium concentration, intravenous fluids and weight during the first 96 hours are shown in the Figure.

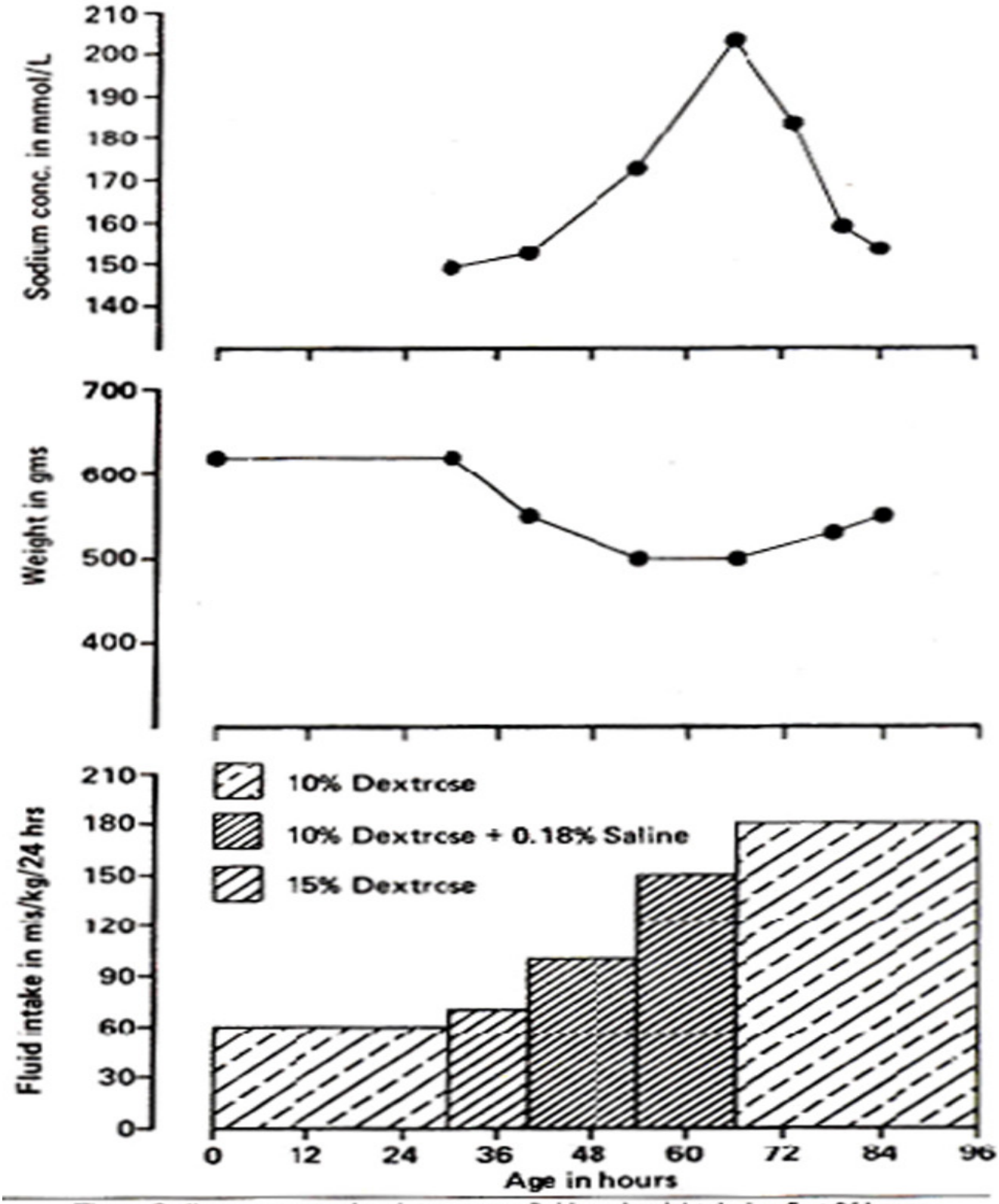

Figure. Sodium concentration, intravenous fluids and weight during first 96 hours.

Her sodium concentration of 204 mmol/l was repeated on two separate venous samples, one of which was analysed independently in the biochemistry laboratory of another hospital. The two determinations varied by less than 2%. She appeared adequately hydrated at this point and her blood pressure was 58/38 mmHg. Her serum urea concentration which was 10.6 mmol/l (29.2 mg/dl) on day 2 rose to 12.3

mmol/l (34.4 mg/dl) on day 3 and to 15.4 mmol/l (43.1 mg/dl) on day 4. Serum creatinine similarly increased from 28 mmol/l (0.3 mg/dl) on day 2 to 41 mmol/l (0.48 mg/dl) on day 3 and 59 mmol/l (0.69 mg/dl) on day 4. Her urine output could not be measured accurately because of practical difficulty in collection. It was estimated at 1-2 mls/kg/24 hours during first 96 hours. The specific gravity of urine was checked on two occasions. It was 1010 at 40 hrs of age and 1020 at 96 hours of age. She was managed with intermittent positive pressure ventilation at a rate of 50/min or less. The oxygen-air mixture used had a humidity of 50-60%. She was nursed in a non-servo incubator throughout and a bubble sheet was used to maintain baby's temperature. After 96 hours of age the baby was maintained on lSOmls/kg/24 hours of parenteral nutrition and there were no further electrolyte problems. The baby went through the usual intensive care with a few minor problems but otherwise made a good recovery. Her mental and physical development as assessed on Denver scale, was considered normal at 6 months, 1 year and 2 years of corrected age.

DISCUSSION

Premature infants regulate salt and water balance poorly, particularly in the first few post natal days[1,3]. Insensible water loss from the skin is also greater in premature infants than term infants because of relatively greater surface area and skin permeability[4]. These factors can cause severe hypernatraemiain very low birth weight babies in the first 72 hours of life[2], a complication frequently associated with mental and physical handicap in older babies. [5,6] Severe hypernatraemia in the above mentioned baby could also be attributed to these factors as the baby was ventilated with a rate of 50 or less with well humidified oxygen in an incubator and the sodium concentration of infusion fluid was checked to ensure against iatrogenic overload. Individual babies fluid requirements vary greatly and daily or more frequent measurements of weight are the most useful indication of the baby's state of hydration, with urine specific gravity a useful adjunct. [7] Slow rehydration with 0.45% saline has been recommended for older infants with hypernatraemia following gastroenteritis[8]. This may not be appropriate for very preterm newborn babies with substantial and acute insensible water losses as in this case. So far as we are aware, this baby's peak serum sodium concentration was higher than any previously. The past decade has seen significant changes in the management of patients with cholelithiasis. An elderly patient with obstructive jaundice who was managed by endoscopic sphincterotomy, nasobiliary drainage and extracorporeal shock wave lithotripsy (ESWL) is presented. A 76 year old woman was admitted to St. Thomas Hospital on 15th March, 1990 with a six days history of colicky pain in the right upper quadrant of the abdomen. The pain was aggravated by taking food and needed Buprenorphine for relief. She also developed dark coloured urine, jaundice and pruritis over the last five days. She had a similar episode of right upper quadrant pam and mild jaundice 18 months back, Ultrasound scan of the abdomen at that time revealed gall stones. She also had barium studies which revealed sliding hiatus hernia. She was a known hypertensive but had no history suggestive of myocardial ischaemia. On examination she was apyrexial, dehydrated and jaundiced. Pulse was 104/mm and BP 150/80 mmHg. No lymphadenopathy was present. Abdominal examination revealed tenderness and guarding in the right hypochondrium but no ascites. Bowel sounds were present and rectal examination did not reveal any abnormality.

Investigations

Full blood count revealed normal haemoglobin, White cell count was 11.8/cmm. Blood chemistry and blood enzymes showed serum bilirubin of 266 mmol/l, alkaline phosphatase 1405 U/L, ALT 265 U/L. Coagulation studies were normal. Ultrasound scan of upper abdomen revealed dilated intrahepatic and common bile ducts with evidence of probable gall stones at the distal end of the common bile duct. The gall bladder was small and shrunken with a small calculus in it. reported in an infant of similar birth

weight. Despite this the hypernatraemia was successfully managed solely by increased intake of free water in Dextrose.

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