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Your Ref:
BMcL-0027-12

Our Ref:
HYP/W50/2

Date:
26th March 2013

Mr B McLoughlin
Assistant Solicitor to the Inquiry
Inquiry into Hyponatraemia-related Deaths
Arthur House
41 Arthur Street
Belfast
BT1 4GB

RECEIVED
2013
INQ-4119-13

Dear Sir

**RE: INQUIRY INTO HYPONATRAEMIA RELATED DEATHS- RAYCHEL
FERGUSON (PRELIMINARY)**

We refer to your letter dated 13th November 2012 and to our letter dated 26th February 2013. Dr McMorrow, one of the authors of the slide presentation, has provided some information pertaining to the slide presentation and the audit.

Dr McMorrow was employed by Altnagelvin Hospital from August 2005 to August 2006. During this time she carried out this audit project under the supervision of paediatric consultant Dr Neil Corrigan. The audit was proposed by Dr Corrigan and facilitated by the Trust audit department. Dr McMorrow presented the information as follows:

- Ulster Paediatric Society meeting May 2006
- Altnagelvin Hospital Audit Symposium June 2006
- Europaediatrics Conference (poster presentation), Barcelona October 2006

Dr McMorrow has forwarded the Abstract for the project entitled "Paediatric Hyponatraemia: Incidence, Aetiology and Management" and we enclose a copy of same.

Yours faithfully



John Johnston
Solicitor

Providing Support to Health and Social Care



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Dear Sir

**RE: INQUIRY INTO HYPONATRAEMIA RELATED DEATHS- RAYCHEL
FERGUSON (PRELIMINARY)**

I refer to the above matter and to your letter dated 13th November 2012, referenced above. I confirm having now received instructions from my client, as follows.

I am informed that, in its efforts to obtain the information requested in your above-mentioned letter, the Western Trust made various attempts to contact both of the authors of the presentation, Dr McMorrow and Dr Corrigan. Dr McMorrow was formerly employed by the legacy Trust in 2000 as a Junior Doctor. However, she is no longer employed by the Western Trust and the Trust is currently attempting to locate her whereabouts.

Dr Corrigan is a Consultant Paediatrician who is currently employed by the Trust at Altnagelvin Hospital. My client had passed on your request for information to Dr Corrigan, and he has only just been able to locate the relevant documentation which he has now forwarded to my client. Accordingly, I now enclose copies of the following documents, for your perusal:-

1. Document entitled- 'Paediatric Hyponatraemia: Incidence Aetiology and Management'
2. 'Hyponatraemia in Paediatric Appendicitis'- Authors, McMorrow, Corrigan et alia.
3. Presentation slides- 'Paediatric Hyponatraemia: Who Gets it and Why?'- Authors, McMorrow and Corrigan.

Providing Support to Health and Social Care



INVESTOR IN PEOPLE

I also enclose a pro forma 'Checklist document' which has been provided to us by the Trust's Professional Audit Department, in connection with Dr Corrigan's Audit.

Yours faithfully

Angela Crawford

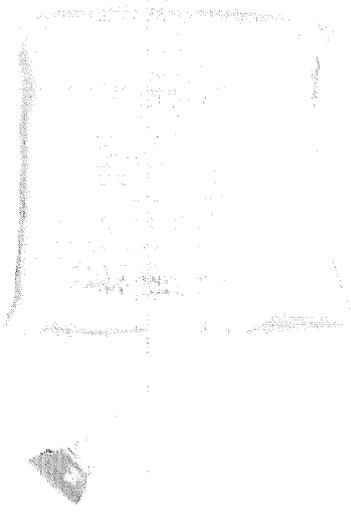
Angela Crawford
Solicitor

Encs.

Acknowledgement

The Author / Authors of this audit project wish to acknowledge the resources provided by Altnagelvin H&SST through the Clinical Audit Department in support of this piece of work.

? Questions



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¹Second Pediatric Department, Venizelio General Hospital, Heraklio, Crete, Greece, ²Antihypertensive Unit, Venizelio General Hospital, Heraklio, Crete, Greece

Background and Aims: The metabolic syndrome in adults is correlated with higher cardiovascular risk. Recently, several studies discuss the presence of metabolic syndrome in children and adolescents. Our purpose was to calculate the frequency of metabolic syndrome in three groups of children and adolescents according Body Mass Index (BMI): 1) BMI > 95th percentile (obese), 2) 95th < BMI < 85th (overweight) and 3) BMI < 85th percentile.

Methods: We studied 106 obese, 30 overweight children and 36 with BMI < 85th percentile who were examined in the Pediatric Obesity Unit in our hospital. The ages ranged from 6,5 to 17 years old. Blood samples were received from all children after 12 hours night fasting and glucose, triglycerides and HDL were calculated. Blood pressure was also measured. The children of our study were considered to have metabolic syndrome if they completed 4 out of 5 of the following criteria according age and sex: BMI > 85th percentile, systolic pressure or/and diastolic pressure > 95th percentile, triglycerides > 95th percentile, HDL < 5th percentile and fasting glucose > 110 mg/dl.

Results: 11 out of 106 (10,36%) of the obese children completed the criteria for metabolic syndrome. The youngest child was a boy 6,5 years old. Only 2 out of the 30 (6,6%) overweight children also completed the necessary conditions for metabolic syndrome. In the group with BMI < 85th percentile there was not found any child with metabolic syndrome.

Conclusions: The relatively high frequency of metabolic syndrome in obese children should alert us in maximizing our efforts towards prevention and treatment of obesity.

PAEDIATRIC HYPONATRAEMIA: INCIDENCE, AETIOLOGY AND MANAGEMENT

A M Mc Morrow, N P Corrigan

Department of Paediatric, Altnagelvin Area Hospital, Londonderry, UK

Background and Aims: Recent publicity has highlighted the potentially catastrophic results of paediatric hyponatraemia. Little data exists however on the overall incidence and course of uncomplicated hyponatraemia in general paediatric practice.

Methods: All children admitted to Altnagelvin Hospital over a 21-month period with hyponatraemia (<133) were identified using our laboratory database. Newborns and infants in NICU were excluded. Retrospective chart review enabled data collection regarding incidence, aetiology and management.

Results: 6,276 children were admitted to Altnagelvin Hospital over the study period. 153 patients (2,4%) had at least one documented episode of hyponatraemia (medical 68% vs surgical 32%). Of 105 medical children, the most common diagnoses were gastroenteritis (25%), viral infections (25%) and lower respiratory tract infection (21%). Of 21 general surgical children, acute appendicitis accounted for 50%. The

incidence of hyponatraemia complicating acute appendicitis was 11%. The primary pathophysiological trigger for the hyponatraemia was attributable to SIADH in 66% of children overall. Hyponatraemia was a presenting feature in 88% of children. Intravenous fluid therapy was prescribed for 61% of children. 0,45% saline / dextrose (64%) and isotonic saline solutions (27%) comprised the majority of prescribed fluids with no children receiving solution 18. Fluid volumes were given as maintenance in 60%, restricted in 31% and potentially generous in 7%. No serious complications of hyponatraemia were identified.

Conclusions: Hyponatraemia is a common complication of acute illness in both medical and surgical children, with SIADH as the primary mechanism. Very hypotonic intravenous solutions are no longer being prescribed, in keeping with regional guidelines.

THE TOLERANCE OF ENTERAL NUTRITION IN CHILDREN WITH ACUTE PANCREATITIS

M Kostrzewska, E Toporowska-Kowalska, J Kadzin, K Wąsowska-Królikowska

Department of Children's Allergology, Gastroenterology and Nutrition, Poland

Background and Aims: Enteral nutrition (EN) is a preferable alimentation form for children with acute pancreatitis (AP). The subject of the study was evaluation EN tolerance in AP patients hospitalized in Children's Allergology, Gastroenterology and Nutrition Department of Medical University in Łódź, in 2005-2006.

Methods: Retrospective analysis involved the course of EN: duration, amount of calories, change of body weight and clinical tolerance of EN in 13 patients aged from 4,5 to 18 years (average 10,6 ± 3,96), with 16 episodes observed. Low-fat, half-elementary diet was applied by nasojunal catheter, using pump.

Results: 13 episodes AP were mild and 3 severe (2 pseudocysts and 1 rupture of pancreas, all treated by drainage). AP etiology: abdominal trauma (n=4), hereditary AP (n=1, 4 episodes), pancreas divisum (n=1), cholelithiasis (n=1), infectious AP (n=2), post valproic acid (n=1), idiopathic (n=3). EN time: 5 to 46 days (average 19±10,99); the shortest course - hereditary AP (average 8±2,58), the longest - in posttraumatic AP (average 28,5 ± 12,28). By EN we ensured the supply of 42,6±13,28 kcal/kg per day on average, reaching rise of body weight 900±678,23 g (2,68±2,02%) in 6 children; the initial weight -2 and decrease - 8 patients (average 600±538,52g; 1,37±1,02%). Undesirable effects (nausea, diarrhoea, vomitus) were observed in 6 patients (37%); 3 (19%) were passing, 3 (19%) - needed modification o nutritional therapy (2 - lower dose of EN, 1 - TPN).

Conclusions: EN is well tolerated by children with mild AP. The patients with posttraumatic AP, developing complications, may cause worse EN tolerance.

CONGENITAL CHLORIDE DIARRHEA: A REVIEW OF 12 ARABIAN CHILDREN

A F El-Hassanien¹, H A Al-Ghiaty²

Paediatric Hyponatraemia: Incidence, Aetiology and Management

AM Mc Morrow, NP Corrigan

Paediatric Department, Altnagelvin Area Hospital, Northern Ireland

BACKGROUND

Recent publicity has highlighted the potentially catastrophic results of paediatric hyponatraemia. There is little data available however on the overall incidence and course of uncomplicated cases in general paediatric practice. We set out to collect information on overall incidence, common causative conditions and management of hyponatraemia, particularly with regard to fluid prescribing.

METHODS

All children admitted to Altnagelvin Hospital between January 2004 and September 2005 with a documented episode of hyponatraemia <130 mmol/L were identified using a laboratory database. Newborns and infants in neonatal intensive care were excluded. A data collection sheet was created with assistance from the acid department. Retrospective chart review then enabled collection of data.

SIADH

The primary physiological trigger for hyponatraemia was felt to be attributable to SIADH in 2/3 of cases. Over 1/2 (65%) were prescribed intravenous fluids although just 41% (27 children) were then fluid restricted.

RESULTS

There were almost 8,300 general paediatric and surgical admissions to the children's ward over the study period. 147 children (2.3%) were identified and excluding children which were not available, 133 children were included in the study. 117 children (88%) had a medical diagnosis, giving an incidence of 2.7% overall of medical admissions. 19 (14%) children were looked after by surgical specialities. The distribution of medical diagnoses is shown in Figure 1.

HYPONATRAEMIA ON ADMISSION (N=88%)

The majority of children (119) were hyponatraemic on their admission blood sampling. We wanted to find out how many of these children had received intravenous fluids and whether this impacted on the time it took to correct their sodium level. Overall, almost 70% (81 children) were managed with intravenous fluids, with no difference in percentages between the medical and surgical groups. The mean sodium level was 116mmol/L in those who received fluids and there was little difference in time to correction (24hrs). We also then wanted to look at the types of solution used to see whether this affected time to correction. Overall the most frequently prescribed fluid was half normal saline/dextrose. As expected those given normal saline or normal sodium solution corrected more quickly (22hrs compared with 25 hrs).

APPENDICITIS

Of the 19 surgical children, almost 50% had acute appendicitis. With a total number of 79 appendicectomies carried out in the hospital over the study period, the incidence of hyponatraemia complicating acute appendicitis overall was 11%. Most of these children were hyponatraemic on admission. Regarding fluid management, slightly more children were prescribed 0.45% saline/dextrose than normal saline or half normal. Surprisingly this did not make a difference to the lowest mean sodium result (132mmol/L). All of these children had longer times to correction compared with other diagnoses (22.7 hours (0.85% saline) 35 hrs (0.9% saline).

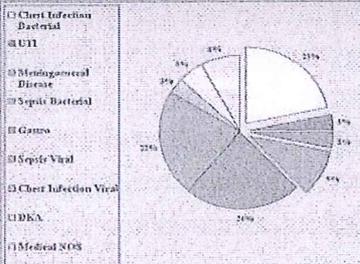


Fig. 1: Medical Diagnoses

NORMONATRAEMIA ON ADMISSION (N=12%)

12 children became hyponatraemic during their hospital admission. They were slightly more medical than surgical children in this group. 3/4 overall had been prescribed intravenous fluids which were mainly given as 0.45% saline/dextrose. Following detection of hyponatraemia, 43% were then appropriately changed to normal saline. The mean lowest sodium result was exactly the same in those who received fluids and those who didn't (132 mmol/L), although the children managed with oral fluids appeared to correct their sodium levels more quickly (22hrs compared with 25hrs).

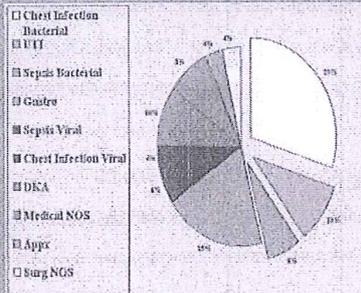


Fig. 2: Sodium < 130

28 patients (21%) had a sodium level of <140 mmol/L. A significant percentage of these patients had other infections, mainly chest and urinary tract infections. There was also a large number of children with gastroenteritis and an increased number who had DKA compared with the overall group.

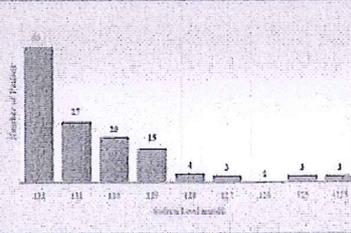


Fig. 3: distribution of lowest Na⁺

GENEROUS VOLUMES

5% of patients (6 medical patients and 1 surgical patient) received potentially generous fluid volumes. The overall mean time to correction of sodium in this group was 31 hours, longer than the other average correction times.

CONCLUSION

Hyponatraemia is a common complication of both medical and surgical illness. The incidence is high in appendicitis and chest infections. May be related to severity of illness. Very hyaline solutions (e.g. 0.45% saline) are no longer prescribed in Northern Ireland. Isotonic solutions appear to correct hyponatraemia more quickly.