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COVER

“Sara Handing a Toy to the Baby” was painted by Mary Cassatt (1845 – 1925). Cassatt, an American artist, was the daughter of a wealthy Philadelphia businessman. She went to Paris to study and never returned. Most of her paintings are of mothers and children, although she herself never married. This lovely painting shows an older sibling handing a toy to her younger brother. We all know that sibling relations are never this serene at all times, but we can always encourage the sharing and love so beautifully shown here. (This painting is reproduced with the permission of the Hill-Stead Museum, Farmington, CT).

ANSWER KEY

Incidence of Recurrence of Sudden Infant Death Syndrome


Incidence figures for sudden infant death syndrome (SIDS) are affected by the specific population being studied, the method of data collection, the way in which the diagnosis is determined, and other variables. The occurrence of SIDS per 100 live births has been estimated to be 1.3 in Norway, 2.1 in South Australia, and 2 to 3 in the United States. Subsequent siblings are at increased risk of SIDS, with estimates ranging from 3.7 times that of the general population to as high as 10 times.

Beal et al found that families in South Australia who lost a child older than 12 months of age to SIDS were 11 times more likely to have a subsequent child with SIDS than were families in which the SIDS victim was younger than 1 year of age. Other risk factors for recurrence were miscarriage in a previous pregnancy, threatened miscarriage during the pregnancy of the SIDS victim, severe social deprivation, family history of sudden and unexpected death in children or young adults, and bronchomalacia found at autopsy in the child who died of SIDS. The 92% of families who did not have these risk factors had a recurrence of SIDS of only 1.6 times the expected rate, whereas the 8% with risk factors had a much higher incidence.

Peterson et al found that first cousins of SIDS probands had the same incidence as the general population. In contrast, Beal et al found a five-fold increase in incidence in secondary relatives and a four-fold increase in tertiary relatives (including first cousins). Being the twin of a SIDS victim does not seem to be a risk factor, and the SIDS rate among adopted children corresponds to that of the community at large.

Studies of the recurrence of SIDS have produced small amounts of information that suggest that both environmental and genetic factors affect the likelihood of this catastrophe occurring.

Comment: Despite the problems of arriving at accurate data and the wide range of the incidence figures, it seems clear that subsequent siblings of a SIDS victim are at increased risk, although some families are more likely than others to have a second child affected. Practitioners will find in these conclusions a justification for putting subsequent babies on a home monitor, imperfect though this preventive measure may be. Researchers may find clues in recurrence studies to the cause of this phenomenon. Parents of SIDS victims are less likely to be influenced by numbers; statistics on how rarely people are struck by lightning do not mean much to someone who has survived a direct hit. However, parents may derive some comfort from knowing that 97% or more of subsequent children will not be affected.

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Associate Editor
unexplained metabolic alkalosis should undergo urinary screening for diuretics.

**Hypokalemia**

The high K content of the gastric fluid lost as a result of vomiting due to pyloric stenosis, gastroesophageal reflux, or gastric suction is an important contributing factor to the hypokalemia encountered in metabolic alkalosis. Hypokalemia contributes to the hypokalemic metabolic alkalosis may develop in patients receiving chronic loop or thiazide diuretic therapy. In these instances the K deficiency is caused by urinary loss of K. Muscle weakness and abdominal distension (due to intestinal ileus) are symptoms of K deficiency. Electrocardiographic changes of hypokalemia include prolongation of the Q-U interval; widening, flattening, or inverting of the T wave; prominent U waves; diminished QRS voltage; and increased A-V conduction time. A serious cardiac consequence of hypokalemia is the propensity to provoke digitalis toxicity. Appropriate monitoring and management of patients with ongoing losses of fluid from the upper gastrointestinal tract and of those on diuretics can prevent the hypokalemic metabolic alkalosis frequently encountered in these patients.

**Epilogue**

A major objective of this review of fluid and electrolytes is to emphasize the close relationship between body fluid physiology and the care of patients. The same principles prevail whether providing a mother with guidance in the management of a febrile infant at home or writing orders for parenteral fluids for a severely dehydrated child in the hospital. Most of our patients with "fluid problems" will be well served if the physician recognizes the origin and magnitude of the usual fluid expenditures (from the skin, the lungs, and the urinary tract) and of increased fluid expenditures such as those associated with fever, hyperventilation, or gastrointestinal losses. The physician must monitor kidney function, usually by estimating urinary volume and with blood chemistry studies, to determine whether the fluid and electrolyte aspects of therapy are leading to correction (or prevention) of disturbances in body fluid physiology.

**Suggested Reading**


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**FluID AND ELECTROLYTES**

Clinical Aspects

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**PIR Quiz**

13. Of the following statements regarding principles of parenteral fluid therapy, all are correct except:

A. The volume estimated for maintenance fluid is determined by the basal metabolic rate (energy production).
B. Daily maintenance sodium needs are met by providing 2 to 3 mEq/100 mL of maintenance fluids.
C. Renal water allowance beyond the neonatal period is governed primarily by maturity of concentrating ability.
D. A useful formula to calculate maintenance needs for a 15-kg child is:

\[
1000 \text{ mL} + (50 \text{ mL/kg of weight above 10 kg})
\]

E. The magnitude of daily insensible water loss is dictated by the daily caloric expenditure.

14. Of the following, the most correct statement regarding parenteral fluid management is:

A. For the very low-birth-weight infant (＜1500 g), an initial diuresis after birth results in fluid needs in the range of 130 to 150 mL/kg per 24 hours.
B. In isotonic dehydration, an estimated 5% dehydration indicates a deficit approximating 100 mL/kg of weight.
C. A dehydrated infant with an initial serum Na⁺ of 125 mEq/L has a sodium deficit approximating 5 mEq/kg.
D. An initial hydrating solution containing 100 mEq/L of sodium can be given safely at the rate of 30 mL/kg per hour to an infant with a serum sodium of 165 mEq/L.
E. Maintenance fluid therapy in the normally hydrated patient should result in urine flow rates exceeding 10 mL/hour per 100 mL given.

15. A dehydrated infant with a 3-day history of diarrhea is admitted with the finding of somnolence, which rapidly progresses to generalized seizures without fever. Serum sodium is 120 mEq/L. True statements in this circumstance include all of the following except:

A. Home remedies have consisted primarily of sugar solutions.
B. Reversal of symptoms is expected with the intravenous administration of sodium salts calculated to elevate serum sodium by 10 mEq/L.
C. Initial urinary concentration of sodium will be less than 20 mEq/L.
D. Administration of anticonvulsant medications constitutes an appropriate step in management.

16. In distinguishing between acute renal failure and prerenal azotemia, the most correct statement is:

A. Urine volume will be profuse in prerenal azotemia.
B. Fractional excretion of sodium requires analyses of serum and urine for sodium and chloride.
C. Renal adaptive measures to hypoperfusion can be documented in prerenal azotemia.
D. The urine/serum creatinine ratio is in excess of 50 in acute renal failure.
E. The high urinary osmolality found in both conditions negates the usefulness of this measurement in diagnosis.

17. Among the following, the most correct statement regarding electrolyte disorders is:

A. Hypokalemia is associated with a higher mortality than hyperkalemia.
B. Loop diuretics are frequent causes for the combination of metabolic alkalosis and hypokalemia.
C. In the Syndrome of Inappropriate Antidiuretic Hormone (SIADH), urinary sodium concentration is low.
D. A low anion gap is expected in congenital errors of leucine metabolism.