Pyloric stenosis

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Myth: the classic electrolyte abnormalities of metabolic alkalosis, hypochloremia and hypokalemia are a common finding in children with pyloric stenosis.

Introduction

In 1717, Blair first described pyloric stenosis based on autopsy findings.[1] It was not until 1887 that Hirschsprung described the clinical picture and pathology of pyloric stenosis.[1] Ninety years later, Teele and Smith described the use of ultrasonography to diagnosis pyloric stenosis.[2] Traditionally, this diagnosis has been based on the clinical findings of projectile nonbilious vomiting, the palpation of a pyloric tumour (or "olive"), and the presence of classic metabolic disturbances. Currently, ultrasonography is regarded as the diagnostic test of choice for an infant presenting with nonbilious emesis in which an "olive" is not palpated.[3]

Comment

Traditional teaching tells us that patients with pyloric stenosis will present with the classic laboratory picture of hypochloremic, hypokalemic metabolic alkalosis. The severity of the electrolyte disorder is dependent on the duration of illness preceding detection and resuscitation.[1,4] But heightened physician awareness of the clinical presentation of pyloric stenosis has led to earlier diagnosis and a decrease in the frequency of the classic electrolyte findings.[1,4–6]

Chen and colleagues reviewed 100 infants treated for pyloric stenosis over a 2-year period to examine the effect of early detection by ultrasonography on their care. These authors documented metabolic alkalosis (or acidosis), hypokalemia and hypochloremia in a minority of children: 10%, 5% and 3% respectively. They attributed the low prevalence of metabolic derangement to earlier detection; in other words, pyloric stenosis was diagnosed before the infants became ill enough to develop classic electrolyte abnormalities. In turn, these authors attributed earlier detection to the widespread use of ultrasonography.[5]

Hulka and colleagues[4] retrospectively reviewed 901 infants undergoing pyloromyotomy for pyloric stenosis between 1969 and 1994. These authors compared patients who presented during the early years of the study with those who presented during the latter years, finding that more recent patients were younger and half as likely to present with hypochloremic alkalosis. They concluded that infants with pyloric stenosis are increasingly diagnosed before metabolic derangements occur. Again, they attributed this to the earlier use of imaging studies.[4]

Papadakis and coworkers[6] retrospectively documented biochemical findings in 283 children with pyloric stenosis who presented during 3 discrete time windows spanning 2 decades (1973–75, 1983–85 and 1993–95). These authors noted that 88% of children did not have electrolyte abnormalities on admission, and that age at diagnosis has fallen by 2 weeks since 1975. They attributed earlier diagnosis to increasing physician awareness and to a rise in the diagnostic imaging rates, from 27% to approximately 100%, but did not link improvements specifically to ultrasound use, noting that the earlier diagnosis predated the widespread availability of ultrasound and began during a time when upper gastrointestinal contrast studies were performed in cases of diagnostic uncertainty.

Conclusion

Hypochloremic, hypokalemic metabolic alkalosis is now an uncommon and late finding in patients with pyloric stenosis. Earlier diagnosis in the modern era is related to

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increased physician awareness and more widespread use of diagnostic imaging, although not specifically to the use of ultrasonography.

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