Case report

Apparent Life Threatening Event and gastric antral ulcer in a full-term infant: any possible relationship?

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Abstract. We describe the case of an apparently healthy newborn infant who in 7th day of life showed an episode of haematemesis and in 13th day of life presented an episode of apparent life threatening event (ALTE). A fibroscopy of the upper digestive tract showed a great ulcer of the gastric antrum and esophagitis limited to the mucosa. Gastrinemia in the blood showed high values (121 pg/ml). The relationship between ALTE and gastric ulcer may be casual, however in literature a gastroenteric cause is present in about 50% of ALTE in which an etiologic cause is found. We speculate that in the present case the increase of gastrin secretion reduced gastric pH which facilitated the onset of gastric ulcer and esophagitis with ALTE due to pain or reflex. (www.actabiomedica.it)

Key words: Newborn infant, gastric ulcer, apparent life threatening event, fasting gastrinemia

Introduction

Gastric ulcer in a newborn infant is an event that is usually associated with conditions of acute distress such as prematurity, neonatal intensive care, and sepsis (2, 8). An apparent life threatening event (ALTE) is a clinical condition characterized by at least two of the following symptoms: apnoea, acute heart frequency changes, changes in muscular tone and skin colour, obstruction of airways that requires vigorous stimulation and frightens the observer (1). At present a certain ethiopathogenetic cause for ALTE as well as for Sudden Infant Death syndrome has not been identified (5).

Case

E.O., male infant, born at 39 weeks of gestation through vaginal delivery. Apgar score at 1st min was 9 and at 5th min. was 10. Birth weight was 3150 g (25-50° centile), lenght 56 cm (>90° centile), head circumference 36 cm (75-90° centile).

The baby was discharged from the nursery in the 3rd day of life, was exclusively breastfed and in good clinical conditions. In 7th day, apparently healthy, the infant had an episode of haematemesis. He was referred to the Pediatric First Aid Ambulatory of our hospital where clinical examination was normal, and the episode was thought to be due to the presence of maternal breast fissures. For this reason the baby was discharged and no other exams were believed necessary. In 13th day the newborn infant presented an episode of ALTE during the night. The event was described by parents as follows: the mother casually entered the room and found him pale and hypotonic and apparently unconscious. She picked him up, stimulated him, and performed mouth-to-mouth respiration because the baby did not respond. The unresponsive period probably lasted for at least 20 sec. The baby was taken to our hospital and admitted to our unit. A history of cyanosis in the elder sibling during the first

months of life associated with gastroesophageal reflux was recorded. At clinical examination the baby presented normal cardiac, respiratory and neurological findings. Perionychia of the 2nd finger of the left hand was present, resolved after povidone administration. The infant entered the basic protocol for ALTE and underwent the following exams: continuous monitoring of heart, breathing and oxygen saturation, cardiorespirography, ECG, chest X-ray, echocardiography, gastroesophageal and abdominal echography, brain ultrasounds, CBC, CRP, serum electrolites, blood glycemia, BUN, transaminases, ammonia, lactic acid, ABG, naso-pharyngeal and blood cultures. Due to the previous episode of haematemesis blood coagulation was also checked. A short sub-diaphragmatic oesophagus (9 mm), a His angle of 90° and a "cone of traction" were found. For this reason a fibroscopy of the upper digestive tract was performed which showed a great ulcer of the gastric antrum (Figure 1) and oesophagitis limited to mucosal lesions. In this condition biopsies were not performed due to the blood coagulation alterations and the emergency situation. On the basis of the fibroscopy findings fasting gastrinemia was measured in the blood and a high value was shown (121 pg/ml) with chemiluminescence kit (Immulite 2000, Medical Sistem®; normal fasting values 0-60 pg/ml). After one month of therapy (domperidone: 1 mg/kg/day divided in three doses and ranitidine: 8 mg/kg/day in two doses) a second gastroesophageal endoscopy showed the complete recovery of the gastric ulcer. The mucosal biopsies demonstrated regenerative epithelial hyperplasia with absence of *Helicobacter pylori*. Fasting blood gastrin levels were normal at this time. Parents refused to perform ph-impedance monitoring thereafter. No other ALTE and/or haematemesis episodes were recorded.

Figure 1.

Discussion

The most frequent problems associated with an ALTE are digestive ones (3, 7). The development of new techniques and equipment has given the possibility to successfully perform endoscopic procedures, esophageal impedance and ph- monitoring even in newborns (4, 8). Newborns and children affected by severe perinatal diseases show the highest risk of developing gastro-esophageal complications in the first days of life, especially hemorrhagic gastritis and esophageal lesions (8). Ulcers are less frequently reported (5, 10). Our case showed regards a gastric ulcer diagnosed in an apparently healthy newborn with a diagnosis of ALTE: the finding of lesions after some time from birth and in good health condition is rare. An association is well known between ALTE and gastro-esophageal reflux (GER), which is not true for ALTE and gastric ulcer (2). On the contrary gastric ulcer is usually associated with clear gastroenteric symptoms (10). Five days before the described ALTE episode, the newborn had haematemesis thought to be caused by maternal breast rhagades. No further investigations were performed. Hence it is not possible to define whether the bleeding was caused by maternal breast rhagades or gastric ulcer. The relationship between ALTE and gastric ulcer may be casual, however in literature a gastroenteric cause is present in about 50% of ALTE in which an etiologic cause is found (7). The ALTE episode could derive from the gastric ulcer through two mechanisms: a pain induced vagal reflex or an ab ingestis due to slow gastric emptying. The baby could have had no-clinically evident GER because anatomically predisposed, as resulted from gastro-oesophageal junction echography that revealed a short

sub-frenic oesophagus, or due to the oesophagitis documented by fibroscopy. Several theories have been proposed concerning the origin of neonatal gastric ulcer; among them we point out a possible trauma secondary to gastric aspiration and / or in conjunction with altered coagulation. However these situations were not present in the reported case. The reason why this gastric ulcer appeared is still to be defined. A role seems to be attributable to the increase of gastrin secretion with reduced gastric pH. Hypergastrinemia in the neonatal period is a known phenomenon (6, 9). Breastfeeding favours the increase of serum gastrin levels in full-term infants (11). Moreover the values of serum gastrin reflect an adaptation to develop digestive capacities progressively increasing in the first days of life to satisfy the increasing amount of introduced milk (9). In our case we theorize that the possible explanation for the development of gastric ulcer was the transient fasting hypergastrinemia, being a well thriving breastfed full-term infant. The complete normalization of gastrin levels after 1 month excludes the presence of any underlying gastro-enteric disease.

Conclusions

Gastro-intestinal investigations in cases of ALTE have a primary importance. Transient hormonal changes probably secondary to adaptation to extrauterine life and to partially mature feed-back mechanisms may justify a gastric mucosal lesion. ALTE would then become only the epiphenomenon of a disease that can be cured. We suggest to include the dosage of fasting blood gastrin levels into the protocols of investigations for unexplained ALTE. All different possible investigations according to the described cases in literature are very long and expensive but we think that the study of polymorphism in the serotonin transporter gene may help to find subjects at risk for SIDS and may decrease the number of investigations.

References

1. American Accademy of Pediatrics Task Force on Sudden Infant Death Syndrome. The changing concept of sudden infant death syndrome: diagnostic coding shifts, controversies regarding the sleeping environment, and new variables to consider in reducing risk. *Pediatrics* 2005; 116: 1245.
2. Arad-Cohen N, Cohen A, Tirosh E. The relationship between gastroesophageal reflux and apnea in infants. *J Pediatr* 2000; 137 (3): 321-6.
3. Dewolfe CC. Apparent life-threatening event: a review. *Pediatr Clin North Am* 2005; 52 (4): 1127-46.
4. Dupont C, Berg A, Lagueunie G, et al. Apparent life threatening events in a neonate with severe lesion of esophagus and stomach. *J Pediatric Gastrenterol Nutr* 2000; 31: 170.
5. Goyal A, Treem WR, Hyams JS. Severe upper gastrointestinal bleeding in healty full-term neonates. *Am J Gastroenterol* 1994; 89: 613.
6. Janik JS, Akbar AM, Burrington JD, Burke G. Serum gastrin levels in infants and children. Pediatrics 1977; 60 (1): 60-4.
7. Kahn A. Recommended clinical evaluation of infants with an apparent life-threatening event. Consensus document of the European Society for the Study and Prevention of Infant Death, 2003. *Eur J Pediatr* 2004; 163: 108-15.
8. Lazzaroni M, Petrillo M, Tornaghi R, et al. Upper GI bleeding in healthy full term infants: a case control study. *Am J Gastroenterol* 2002; 97: 89-94.
9. Marchini G, Persson B, Uvnas-Moberg K. Plasma gastrin and somatostatin levels in infants during the first 4 postnatal days. *J Dev Physiol* 1990; 14: 157-62.
10. Skiner S, Naqvi M, Bisskinis EK. Gastric ulcer presenting as gastroesophageal reflux and apnea in a term neonate. *Tex Med* 1998; 94: 57-8.
11. Zarate A, Ochoa R, Fonseca E, Moran C. Hypergastrinemia of newborns and infants during breast feeding. *J of Soc for Gynecol Invest* 1995; 2: 531-34

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