HYPOTHERMIA IS AN IMPORTANT CLUE FOR HYPOTHYROIDISM IN CHILDREN AND ADOLESCENTS

Aaron Hanukoglu MD[1,2] and Shirli Abiri MD[1]

[1]Department of Pediatrics, Division of Pediatric Endocrinology E, Wolfson Medical Center, Holon, Israel
[2]Faculty of Medicine, Tel Aviv University, Tel Aviv, Israel

TO THE EDITOR:

We read with interest the retrospective study by Ohana Sarna and colleagues [1] titled *Clinical Characteristics, Etiology, and Outcomes of Hypothermia in Well-appearing Children Referred to the Emergency Department.* The study comprised 99 children younger than 16 years of age who presented to pediatric emergency department (PED) with hypothermia (temperature of < 36.5°C). The authors evaluated the incidence of serious bacterial infection (SBI) in 15 infants aged 0–3 months, 71 children aged 3–36 months, and 13 children older than 36 months. They concluded that the incidence of SBI in infants younger than 3 months of age was low and the older children had a benign course and outcome. As pediatric endocrinologists, we would like to mention another important cause of hypothermia, especially in infants but also in children: congenital and acquired hypothyroidism.

In congenital hypothyroidism, hypothermia is considered an important symptom of hypothyroidism that requires immediate measurement of thyroid function tests (thyroid stimulating hormone [TSH] and thyroxine [FT4]). Since the typical symptoms and signs are absent at birth in many infants, these examinations are necessary regardless of the national screening test results and even after the neonatal period [2]. During our career, we encountered a few infants who presented with hypothermia beyond the neonatal period as a result of hypothyroidism. Especially during cold environmental temperatures, even mild hypothermia should alert for the underlying hypothyroidism. Since early diagnosis and treatment are crucial in hypothyroidism to prevent neurodevelopmental sequela, hypothermia requires immediate examination of thyroid function tests in infancy.

Regarding hypothermia resulting from hypothyroidism in older children, we describe two patients with unusual features who first presented with hypothermia that resulted from underlying hypothyroidism that was undiagnosed until their admission. One of the patients had concomitant cortisol and growth hormone deficiencies due to panhypopituitarism diagnosed following his admission because of hypothermia. In the second patient, the event with hypothermia was the only symptom before the appearance of additional clinical and laboratory data consistent with autoimmune hypothyroidism, as described below.

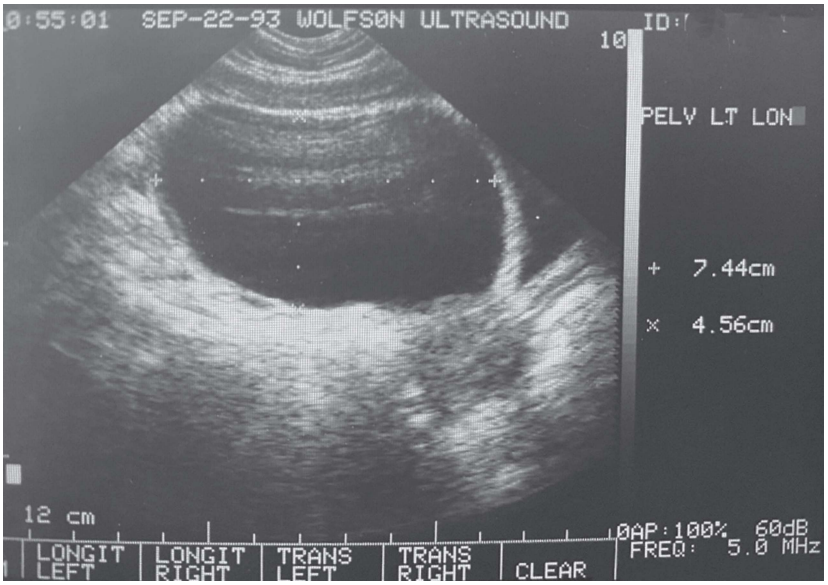
PATIENT 1

An 8-year-old boy was referred to PED for drowsiness. He did not wake up in the morning. He had diarrhea for one day. Otherwise, his past medical history was not remarkable. On admission, his temperature was 34.5°C. On physical examination, horizontal nystagmus was noted. Laboratory examinations revealed severe hypoglycemia of 16 mg/dl (normal 70–100 mg/dl) with a very low, concomitant cortisol level of 11 µg/dl. (normal during hypoglycemia 14.6–29.5 µg/dl). Thyroid function tests were consistent with central hypothyroidism with normal TSH (TSH 3.18, normal 0.5–5.0 mIU/L) and very low FT4 0.59, normal 0.7-1.9 ng/dl). After initial therapy with intravenous hydrocortisone and glucose in the PED, his condition improved within a few hours. He also started Eltroxin therapy, which normalized his thyroid function tests. Subsequently, brain magnetic resonance imaging showed an ectopic posterior pituitary gland with a small, shallow anterior pituitary gland with a thin pituitary stalk, consistent with panhypopituitarism. He had also optic atrophy. The diagnosis of septo-optic dysplasia, a syndrome characterized by optic nerve hypoplasia, midline brain abnormalities, and pituitary gland abnormalities was established. He also had growth hormone deficiency. Currently, he is taking daily Eltroxin, hydrocortisone, and growth hormone therapies. It should be noted that adrenocorticotrophic hormone deficiency alone may also present with hypothermia, especially in neonates [3].

PATIENT 2

A 9-year-old girl was referred to our pediatric endocrinology clinic for vaginal bleeding that started two days before her referral. The anamnesis revealed that a few days before, she had difficulties waking up in the morning and felt cold. The temperature measured by the mother was below 36°C. This happened in September 1993 and the mother attributed this event to the low environmental temperature the night before. The family did not seek medical attention since she recovered quickly after warming up at home. Otherwise, her medical history was not remarkable. On physical examination, only breast buds were evident. The thyroid gland was not palpable. On laboratory ex-

Figure 1. A large left ovarian cyst (7.4 × 4.5 cm)



aminations, TSH 1000 mIU/L (normal 0.5–5.0 mIU/L), FT4 0.1 ng/dl (0.8–1.9 ng/dl). The ovarian ultrasound revealed large ovarian cysts in both ovaries. The right ovarian cyst measured 5.2 × 3.5 cm and left ovarian cyst 7.4 × 4.5 cm. They were interpreted as benign cysts [Figure 1].

Additional laboratory examinations showed significantly elevated titers of thyroid peroxidase antibodies consistent with the diagnosis of Hashimoto thyroiditis resulting in hypothyroidism. Estradiol level was undetectable. The peak luteinizing hormone response to luteinizing hormone releasing hormone (LHRH) of 8.3 mIU/ml, and of FSH 3.8 mIU/ml suggested a pubertal response. The mother also mentioned growth arrest for 5–6 months. The option of surgical intervention was considered but declined because of the well-known association between hypothyroidism and multi-system ovaries, vaginal bleeding, and even precocious puberty [4]. Conservative therapy with Eltroxin (100 µg/day) resulted in normalization of thyroid function tests within a few weeks and the disappearance of ovarian cysts within a few months. Despite initial vaginal bleeding at the age of 9 years, and LHRH test result suggesting precocious puberty, after Eltroxin therapy, vaginal bleeding did not recur, and she had a normal pubertal course.

A repeated LHRH test 4 months later revealed a normal prepubertal response with a peak LH level of 5.4 mIU/ml and FSH of 6.1 mIU/ml. At 9 years of age, the X-ray of the left wrist was compatible with a bone age of 6.5 years. Eltroxin therapy resulted in catch-up growth. She gained 5 cm within 5 months (118 cm at the age of 9 years and 123 cm 5 months later).

Currently, at the age of 31 8/12 years, she is on Eltroxin 650 mcg/week with normal thyroid function tests. She recalls the event of hypothermia at the age of 9 years and as a traumatic event of cold injury. Although the data were compatible with long-standing severe hypothyroidism (the hypothermia and growth arrest) were overlooked and the diagnosis was established only after vaginal bleeding. At presentation, symptoms of hypothyroidism, except hypothermia, were absent in both patients. Last, in severe long-standing cases of hypothyroidism hypothermia is one of the features of myxedema coma. [5].

Correspondence

Dr. A. Hanukoglu
Dept. of Pediatrics, Wolfson Medical Center, Holon 5822012, Israel
Email: ahanukoglu@gmail.com

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If life's lessons could be reduced to single sentences, there would be no need for fiction.
Scott Turow (born 1949), American author and lawyer