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Latent (Transient) Adrenocortical Insufficiency

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In addition to the classical acute and chronic cases of adrenocortical insufficiency there are many patients who have transient adrenocortical insufficiency and who appear healthy in everyday life but may actually have a very limited adrenocortical reserve. Acute adrenal insufficiency may become manifest in these patients during conditions of stress such as surgical procedures, accidents and infections. In many instances, the first evidence of adrenal crisis is unexplained shock in the recovery room. Patients with tuberculosis, especially those with involvement of the genitourinary tract, and those with unexplained lymphadenopathy, with small heart size and females with no axillary hair may have latent or transient adrenal insufficiency. The same is true for patients with chronic gastrointestinal disturbances, and these cases may be misdiagnosed as appendicitis or chronic cholecystitis if this possibility is not considered.

The child presented in this report is a good example of this last group. He was operated unnecessarily for appendicitis in another hospital since the symptoms of chronic gastrointestinal disturbance secondary to transient adrenocortical insufficiency were misdiagnosed as appendicitis.

Case Report

T. B. (Hosp. No.: 66-39044). This 11 year old boy was first seen in Hacettepe Children's Hospital on 8.15.1966 because of malaise and frequent febrile illnesses. The history revealed that the child had apparently been in good health until 6 months of age and that following

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vaccination for smallpox at that time he had developed a febrile illness. In the following years, almost every 15-20 days he became sick with fever, abdominal pain, vomiting and malaise. His family noticed a gradual darkening of his skin and increasing yearning on his part for extra salt in his meals. At 7 years of age he went into shock following a tonsillectomy and had to be kept on intravenous fluids for a week. One month prior to admission, an appendectomy had been performed in an outside hospital because of fever, abdominal pain and vomiting. Pathological examination of the removed appendix had failed to disclose any abnormality.

Physical examination revealed a well-developed boy with a weight of 34.5 kg, height of 142 cms, blood pressure 100/55 mm mercury and pulse rate of 104/min. His skin was dark in color with particular hyperpigmentation in the extension surfaces of joints, in the scar at the operative site, genitalia, the mucosa of the lips and gingiva (Figure 1). The rest of the physical findings were unremarkable, with the exception of sub-mandibular lymphadenopathy.

The admission diagnosis included latent or transient adrenal insufficiency, etiocholanolone fever, familial periodic polyserositis and ketotic hypoglycemia. His laboratory work-up revealed a normal urinalysis, hemoglobin of 12.75 gms, per 100 ml. W.B.C. 7.200/mm^3 and dominance of segmented leucocytes in the peripheral smear. The NPN was 24 mg, FBS 87 mg%, total proteins 7 gm% with albumin 5.1 gm and globulin 1.9 gm per 100 ml, sodium 142 mEq/liter, potassium 4.2 mEq/liter, CO_2 22.6 mEq/liter, chloride 109 mEq/liter. Serum calcium was 7 mg, phosphorus 4.3 mg and the alkaline phosphatase 3.4 Bodansky units. PPD skin test was negative, electrocardiogram revealed a wandering atrial pacemaker. A radiogram of the chest showed the lung fields to be normal, and the heart appeared rather small. A plain film of the abdomen failed to disclose any adrenal calcification (Figure 2). Results of the intravenous insulin tolerance test, following fasting for 12 hours and administration of 0.05 units/kg of insulin, are given in Table I in the form of blood sugar levels. Table II shows the 17-hydroxycorticoid and 17-ketosteroid levels in 24-hour urine, following administration of 50 units of intravenous ACTH in 8 hours, on two subsequent days.

The patient was discharged with a diagnosis of latent or transient adrenal insufficiency and on 2.5 mgs of prednisolone (Deltacortryl) b.i.d. together with extra salt for a few days. He was advised to double the dose of prednisolone in case of stress such as illness, operation or

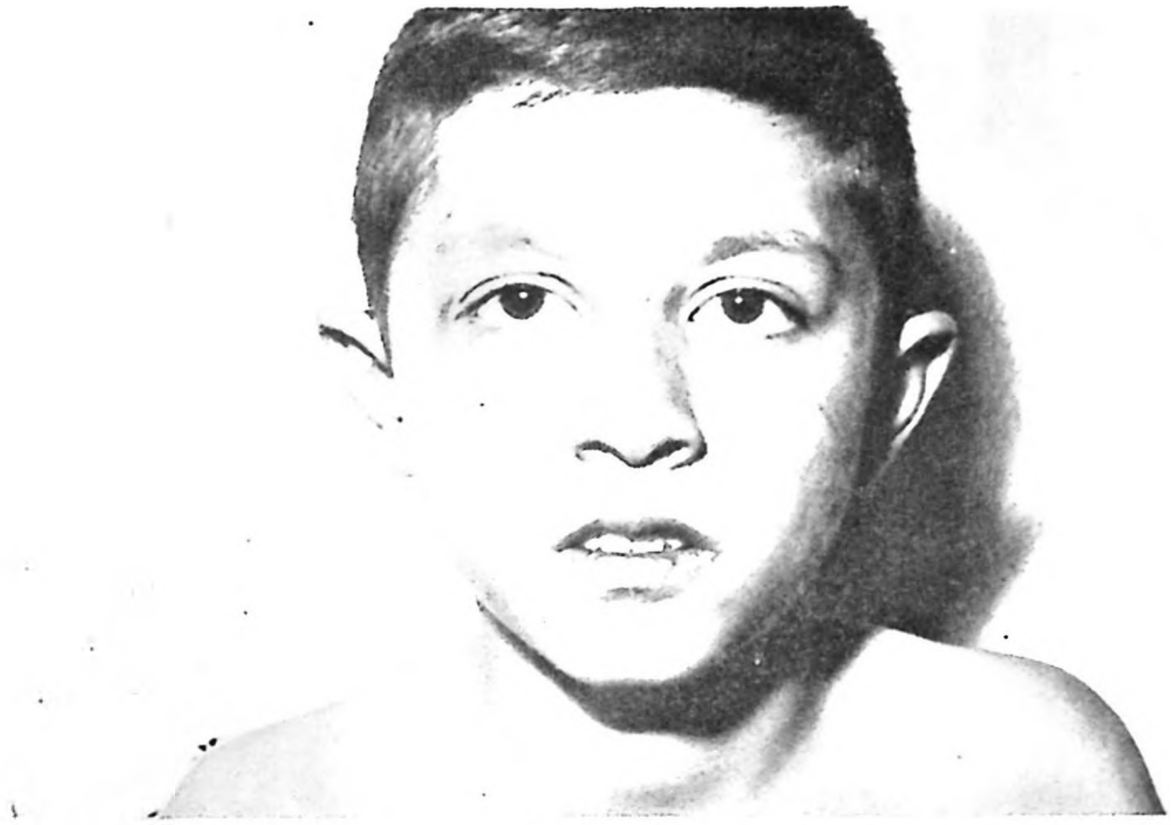

Figure 1 a

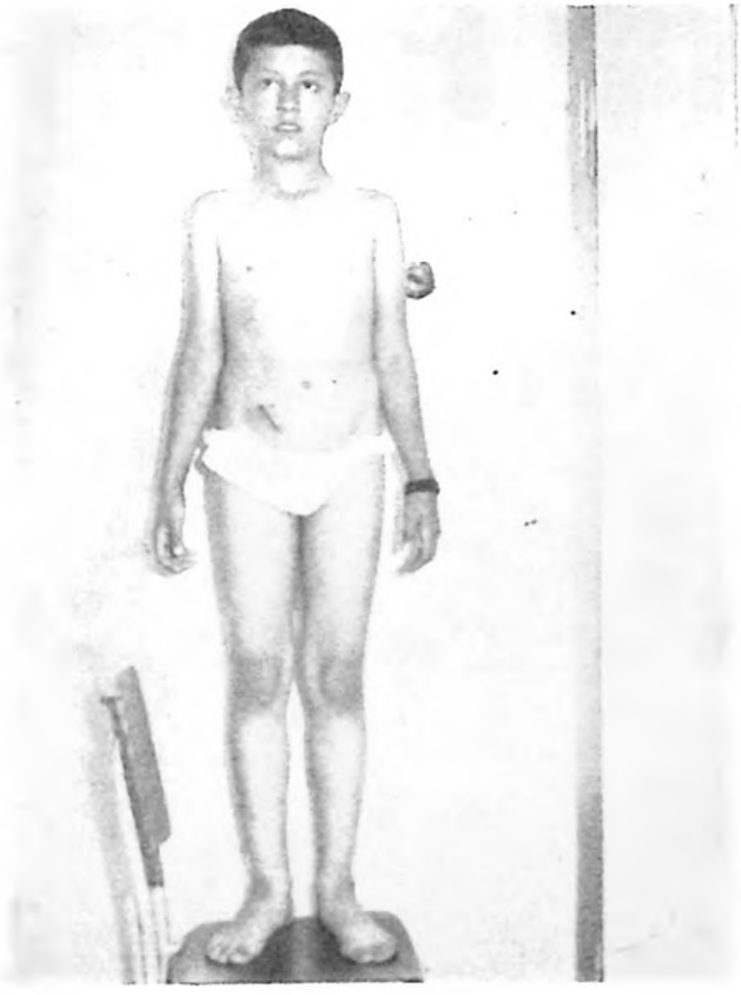

Figure 1 b

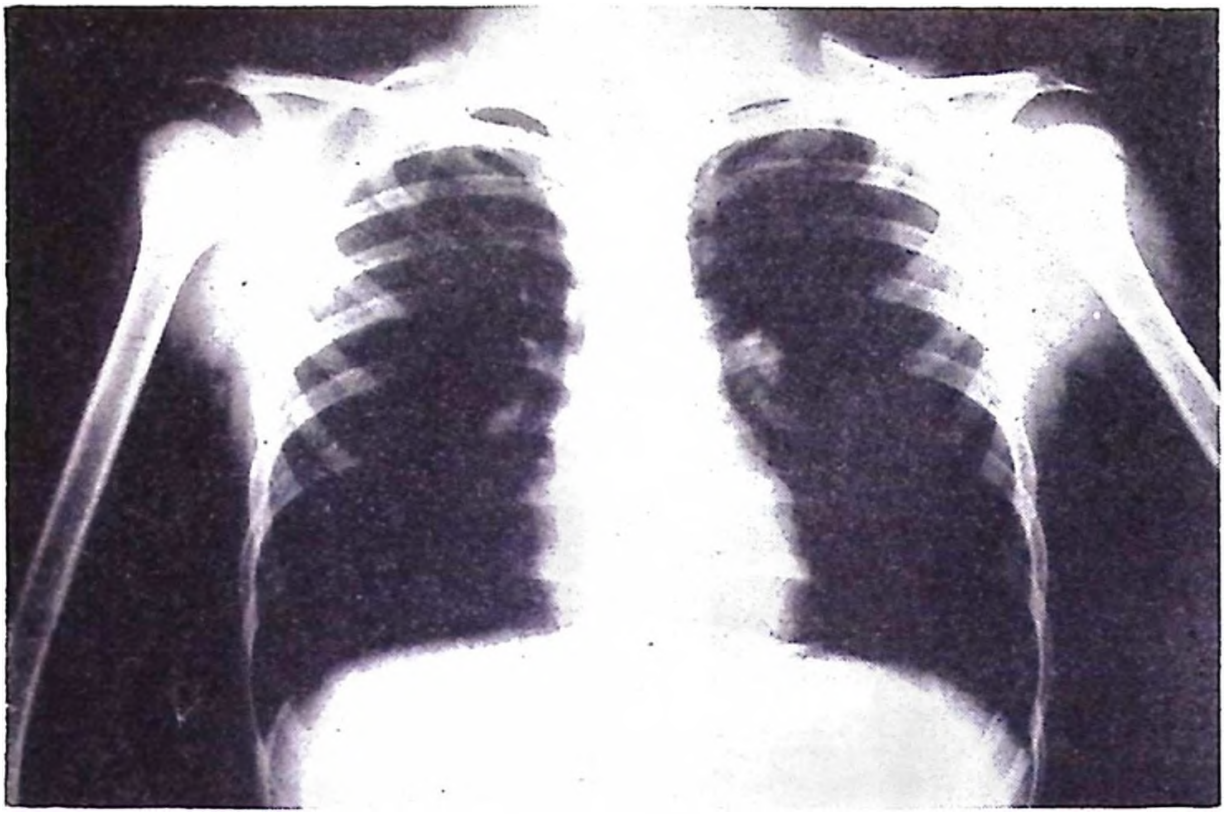

Figure 2 a

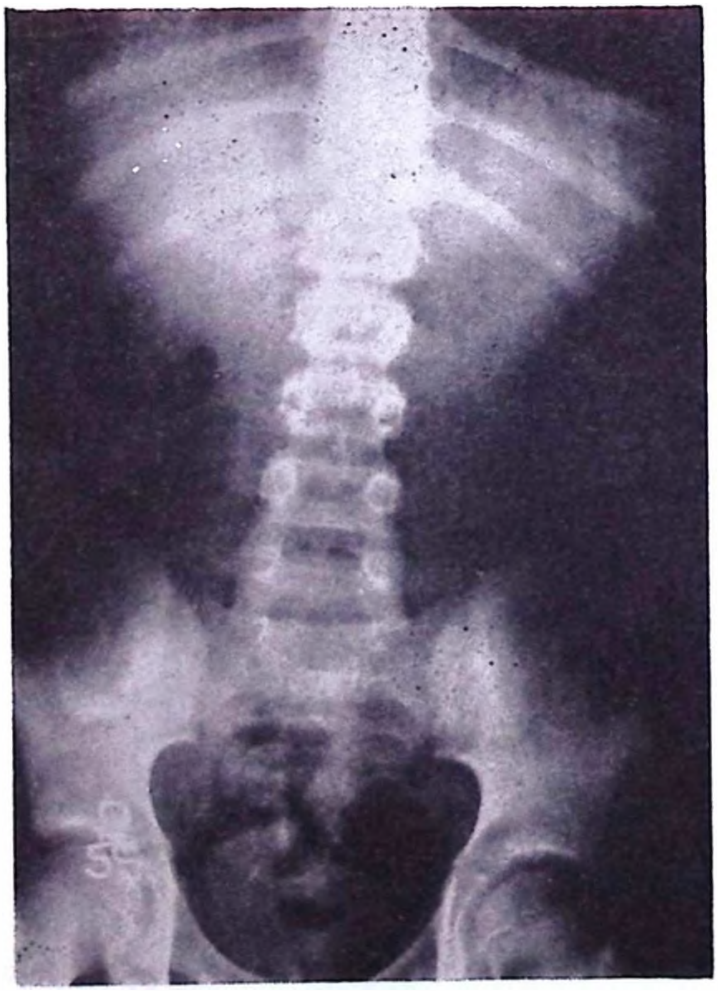

Figure 2 b

TABLE I

THE RESULTS OF INTRAVENOUS INSULIN TOLERANCE TEST

Time	Interval	Blood sugars mg %g
9 A.M	Fasting (Venous)	92.0
	Fasting (Capillar)	96.0
9^{15} "	15 minutes	27.5
9^{30} "	30 minutes	48.0
9^{45} "	45 minutes	64.0
10^{00} "	60 minutes	76.0
10^{30} "	90 minutes	84.0
11^{00} "	120 minutes	96.0

TABLE II

THE RESULTS OF I. V. ACTH TEST

Date	Days	Amount of urine ml/24 hrs	Creatinin mg/24 hrs	17 - KS 24/hrs mg	17 - OH mg /24 hrs
7.17.1966	Control	920	417	2.1	3.2
7.18.1966	Control	480	500	3.0	4.6
7.19.1966	ACTH	520	495	2.1	3.0
7.20.1966	ACTH	552	586	4.1	3.7

accident and to add 2.5-5 mgs of DOCA intramuscularly. The child was followed in our endocrinology clinic at 6-month intervals. After the first 6 months the family reported that his skin had acquired a lighter color, his lips had lost their dark pigmented appearance and that his appetite had improved, with a decrease in his malaise and recurrent illnesses. The dose of prednisolone was decreased to 1.25 mgs t.i.d. at the end of one year, and he was completely asymptomatic on his last clinic visit in December 1970.

Discussion

Adrenal insufficiency has additional forms with certain characteristics apart from the well known acute and chronic forms.

The main steroid hormones produced in the adrenal cortex can be put into three major groups: The glucocorticoids, the mineralocor-

ticoids and the androgens. Total insufficiency of these hormones produces the clinical picture of acute or chronic adrenocortical insufficiency. Since both the site of production and the mechanisms stimulating the secretion of these three groups of hormones are relatively independent, selective hormonal insufficiency may also occur. Among these insufficiencies, isolated hypoaldosteronism,[1] [2] isolated glucocorticoid deficiency,[3] [4] selective glucocorticoid and androgen deficiency in cases of secondary adrenal insufficiency, and glucocorticoid deficiency either alone or together with mineralo-corticoids in cases of congenital adrenal hyperplasia are well-known conditions. Apart from these, there are some patients who appear normal in daily life but who reveal adrenal insufficiency (adrenal crisis) at times of stress in the form of surgery, infections or accidents. This is called latent, transient or partial adrenal insufficiency.[5] These patients produce an adequate amount of hormone under normal conditions, but since their adrenal cortical reserve is limited, they cannot produce additional hormone at times of stress and manifest signs of adrenal insufficiency. In addition, there are cases where chronic adrenal insufficiency accompanies chronic thyroiditis,[6] hyperthyroidism,[7] diabetes mellitus[8] and adrenal medullary insufficiency.

Recurrent episodes of illness with fever, vomiting, abdominal pain and malaise, the occurrence of shock following tonsillectomy in the history of our patient, as well as the hyperpigmentation and the small heart size, are indicative of adrenal insufficiency. A drop of the blood sugar of more than 50 % during the intravenous insulin tolerance test after 15 minutes of half dose insulin administration and the absence of any increase of the 17-hydroxycorticoids following two days of stimulation with ACTH are pathognomonic of this condition. The healthy appearance of the patient in everyday life, and the absence of clinical and laboratory findings of Addison's disease, justify the diagnosis of latent (transient) adrenal insufficiency.

Summary

An 11 year old male with recurrent episodes of fever, vomiting, abdominal pain and malaise is presented. He was diagnosed as having latent (transient) adrenal insufficiency because of his typical history, the presence of pigmentation and the failure of response to ACTH stimulation, and he was treated with prednisolone. The patient was followed for four years, while under treatment, with complete disappearance of his symptoms.

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