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Short Report

Alterations in thyroid function in patients with *Trypanosoma brucei gambiense* infection

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Few studies on the alterations in endocrine function during African trypanosomiasis in man have been reported in the literature, and these concern mainly disorders observed at the gonadotropic axis level (RIDET, 1953; EMEH & NDUKA, 1983; HUBLART *et al.*, 1987). To our knowledge, the thyroid hormone balance has not been investigated, although certain clinical manifestations may be suggestive of thyroid deficiency.

This study was carried out using the double-blind procedure on 10 male and 10 female Congolese patients with parasitologically confirmed trypanosomiasis before treatment, 18 of whom were in the second stage of the disease (over 5 cells per mm^3 of cerebrospinal fluid). The patients were aged between 17 and 60 years (average 35 years). All subjects were clinically examined for symptoms of thyroid deficiency including physical and intellectual fatigue, sensation of excessive coldness, constipation, abnormal dry skin, hair loss, fragile nails, and oedema. Their general level of health was also assessed.

The following basic thyroid hormone assays were carried out by radio-immunoassay: T_4 (thyroxine, 3,5,3′,5′ tetraiodothyronine), T_3 (3,5,3′ triiodothyronine), free T_3 (FT_3), free T_4 (FT_4), rT_3 (reverse T_3 or 3,3′,5′ triiodothyronine) and TSH (thyrotropin).

Twenty-one healthy controls (10 males and 11 females) of the same population and from the same locality aged between 20 and 52 years (average 30 years) were examined as controls.

The results of the basic thyroid hormone assays are shown in the Table. The T_3, FT_3, T_4, FT_4 and rT_3 hormones were significantly decreased in the serum of patients with trypanosomiasis compared to the controls. In contrast, TSH appeared to be increased, but the results were not statistically significant.

Table. Thyroid hormone assays on trypanosomiasis patients and uninfected controls

Hormone	Patients (20)	Controls (21)
Thyroxine (nmol/litre)	78·7 ± 5·7	107·2 ± 4·1 **
Free thyroxine (pmol/litre)	9·23 ± 0·41	14·36 ± 0·50**
3,5,3′ Triiodothyronine (nmol/litre)	0·86 ± 0·11	1·81 ± 0·12**
Free 3,5,3′ triiodothyronine (pmol/litre)	3·02 ± 0·22	4·50 ± 0·27**
Thyrotropin (μiu/ml)	1·92 ± 0·40	1·38 ± 0·15ª
3,3′,5′ Triiodothyronine (nmol/litre)	0·24 ± 0·03	0·41 ± 0·04*

*$P < 0·01$
**$P < 0·001$
ªNot significant ($P > 0·01$)

The clinical survey revealed physical and intellectual fatigue in 12 cases; sensation of excessive coldness in 9, constipation in 5, abnormal dry skin in 6, oedema in 3, hair loss in 2, and fragile nails in 1 case. This showed the frequency of some symptoms usually observed in cases of thyroid deficiency, with a wide dispersion within the studied population. During our investigations one single patient had clinical indications corresponding to a possible hypothyroid condition, but a complete biological check-up did not support this diagnosis.

Recently, it has been reported that trypanosomal infection rapidly impaired the function of the thyroid gland in goats experimentally infected with *Trypanosoma congolense*, and consequently their T_4 levels decreased considerably (MUTAYOBA *et al.*, 1988). Our results concerning T_4 are in agreement with this study.

Concerning the physiopathological origin of the thyroid hormonal disorders we found, it should be borne in mind that (i) the thyroid gland is not strictly implicated because in most cases the TSH level remained normal, even if in 3 individual patients it was increased; (ii) the pituitary might be functional since the TSH level was normal in most cases; and (iii) the abnormalities were essentially characterized by a decrease of T_4 and/or T_3, without significant variation in the level of TSH and without a clinical picture of hypothyroidism.

These observations suggest that some of the patients were suffering from the so-called low T_3 and/or low T_4 syndromes (in which thyroid dysfunction has been detected) (WARTOFSKY & BURMAN, 1982; CHOPRA *et al.*, 1983). These cases are essentially described in severe diseases with chronic evolution and aggravating general symptoms. It has also been established that the low T_3 syndrome involves an increase of the rT_3 hormone. However, in our patients suffering from trypanosomiasis and having a thyroid biological picture similar to the low T_3 syndrome, the rT_3 level remained unchanged.

In conclusion, our results showed a significant decrease of T_3, T_4, FT_3 and FT_4 hormones (without TSH variation) induced by *T. brucei gambiense* trypanosomiasis. The variability in hormone levels found in our patients may have been due to differing individual responses in the host-parasite relationship.

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Short Report

Strain identification of *Trypanosoma cruzi* isolated from *Panstrongylus geniculatus* in Trinidad, West Indies

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The presence of *Trypanosoma cruzi* in Trinidad was first reported by DOWNS in 1963, who isolated the parasite from a rodent, *Rattus rattus*. Subsequently the parasite was found in reduviid bugs (FISTEIN, 1966). Although there is serological evidence suggestive of human transmission (FISTEIN, 1981), to date no confirmed human cases have been recorded. This apparent absence of human infection is possibly related to the transmission cycle of the local strain of *T. cruzi*. As part of an investigation into the epidemiology of American trypanosomiasis in the island, preliminary isoenzyme analysis was done on isolates derived from naturally infected specimens of *Panstrongylus geniculatus* collected from a bat cave.

Cultured isolates were prepared using the procedures described by MILES *et al.* (1980) and were sent to the London School of Hygiene and Tropical Medicine for isoenzyme characterization. Thin layer starch-gel electrophoresis of 7 enzymes (ALAT, ASAT, GPI, G6PD, MPI, PGM and PEP; MILES *et al.*, 1980) was used to determine the strain of *T. cruzi*. These enzymes were selected because collectively the electrophoretic patterns obtained can be used to distinguish zymodemes 1, 2 and 3.

Based on the patterns obtained, the isolate was identified as belonging to zymodeme 3. This zymodeme, though occurring rarely, seems to have a wide but sporadic distribution, having been recorded in Venezuela, Colombia, Brazil and Panama (MILES & CIBULSKIS, 1986). It is frequently isolated from burrowing animals especially armadillos (MILES, 1983; MILES *et al.*, 1980) and has also been isolated from *P. geniculatus* (see MILES, 1983). Zymodeme 3 seems to be predominantly associated with sylvatic transmission cycles, which could explain the lack of human infections in Trinidad, where *T. cruzi* has been recorded only from sylvatic reservoir hosts, such as armadillos and sylvatic species of triatomine bugs (OMAH-MAHARAJ, 1987). It must be noted however that Z3 has been found to be associated with human infections in Brazil and Venezuela, therefore the likelihood of similar infections in Trinidad cannot be ignored.

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