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Triiodothyronine Uptake by Erythrocytes in Mongolism. (26638)

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In view of the recent discovery that mongolism is associated with a chromosomal anomaly, there is good reason to believe(1) that certain enzyme anomalies also exist. During a series of experiments on enzyme systems in mongolism we have observed that red blood cells of mongoloid subjects tend to have a higher oxygen uptake and lower rate of phosphorylation than control subjects(2). In an attempt to explain this phenomenon, we decided to follow up the suggestion of Kurland *et al.*(3) who noted in a series of 9 cases that mongoloid rbc had a "tendency" to a higher triiodothyronine uptake *in vitro*. Our present studies show that this high triiodothyronine uptake is highly characteristic of mongolism.

The method used was the standard radioiodinated triiodothyronine *in vitro* rbc uptake test of Hamolsky, Golodetz and Freedberg(4). We used 23 euthyroid individuals, both male and female, as controls. Their normality was established by one or more of the following criteria: 1) lack of thyroid disorder symptoms, 2) normal protein-bound iodine, and 3) normal neck iodine¹³¹ uptake. Since some of these controls were individuals being tested for thyroid malfunction, the number of borderline cases is probably somewhat higher than might be found in a random normal population. The mongoloid group consisted of 22 individuals, 12 of which were out-patient mongoloid children

ranging in age from 5 to 11 years, 5 mongoloid infants under one year of age, and 5 institutionalized mongoloid adults.* A small group of non-mongoloid retarded children and another group of institutionalized adult psychiatric cases, mostly schizophrenics, were studied for comparative purposes. Abnormal thyroid activity due to medication was ruled out in all cases.

It was found that the triiodothyronine uptake increase was almost invariably present in the rbc of the mongoloid subjects. The mean for the control group, consisting of 23 samples, was 15.4, with a range between 11.8 and 19.3. The mongoloid group, consisting of 22 samples, had a mean value of 22.9, with a range between 13.9 and 29.8. Only 2 mongoloid values fell into the normal range. One of these was a borderline value, while the other was that of an obese borderline hypothyroid mongoloid with a PBI of 3.2. Values in female subjects tended to be slightly lower. When the 2 sexes were considered separately, the borderline hypothyroid mongoloid mentioned above was the only mongoloid subject falling into the normal range (Fig. 1). When the adult psychiatric cases were used as controls a slight

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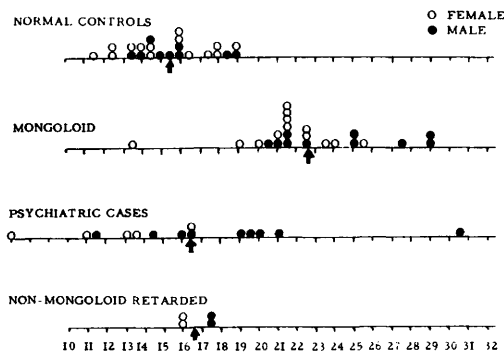


FIG. 1. Triiodothyronine uptake values of erythrocytes, expressed in percentages.

overlapping of values was encountered. Though no correlation with age has been noted by other workers or by us, we found a single remarkably high value in a senile psychotic patient 90 years old.

Summary. The chromosomal anomaly of mongolism suggests the likelihood of enzy-

matic anomalies. In a series of enzymatic studies in mongolism a tendency to high oxygen uptake and low phosphorylation rate in the red blood cells was encountered. In the present study a high triiodothyronine uptake of rbc was found, which throws light on both the high respiratory rate and the uncoupling of phosphorylation. The range of high thyroid hormone uptake values was almost completely outside the range of normal controls, though a few adult psychiatric cases were found with slightly elevated values.

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Tolerance to Bacterial Endotoxin Produced by Proliferation of Gram Negative Bacteria in the Kidney. (26639)

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Tolerance to the toxic effects of endotoxins of Gram negative bacteria has been demonstrated only after repeated injections of dead Gram negative bacteria or their products, but not during the course of clinical or experimental infections(1,2,3). Previous clinical observations by the author suggested that tolerance to bacterial endotoxin did occur during the course of human pyelonephritis and prompted investigation of the effect of experimental pyelonephritis on the pyrogenic response to endotoxins. This preliminary report is based upon the initial observations made during this study.

Material and methods. Unilateral pyelonephritis was produced in six 2.0-3.0 kg male New Zealand rabbits by intravenous injection of 1×10^9 *E. coli* (0-111:B-4), followed immediately by occlusion of the right

ureter for 36 hours. A loose ligature had been placed about the ureter previously through a right flank surgical approach and fixed externally for subsequent tightening. Six weight matched control rabbits underwent a similar operative procedure without ureteral occlusion and received an equivalent endotoxin challenge of 1×10^9 formalin killed *E. coli* (0-111:B-4) on the same day. The pyrogenic response of the control and pyelonephritic rabbits to 0.5 μ g of purified *S. enteritidis* lipopolysaccharide (Difco) was determined 10 to 21 days later.

The rabbits were maintained in wire cages in an air conditioned room without restraint during the experimental period. Two hours were allowed for acclimatization and determination of base line temperatures. *S. enteritidis* endotoxin was injected in the marginal ear vein and temperatures were deter-

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