

LETTER TO THE EDITOR

THYROID FUNCTIONS IN AGING MEN

Sir,

( Received on April 4, 1998 )

Several changes in thyroid functions have been described in elderly and have been largely attributed to concomitant thyroid illnesses. The extent to which aging *per se* contributes to these changes remains to be elucidated. To obviate the fallacies produced by inclusion of hospitalised patients as in many of the earlier studies, we have conducted the present study in nonhospitalised, healthy aged individuals, so as to assess the thyroid functions in a disease and medication free elderly population.

Forty-two healthy aged subjects from 40 to 70 (40-50, 50-60 and 60-70) year age groups were included in this study. It included attendants of the patients and staff members with adequate nutritional status, who were off the medicines. Various thyroidal and non-thyroidal illnesses were excluded by careful history, thorough physical examination and relevant investigations. Serum  $T_3$ ,  $T_4$  and TSH were performed by radio-immunoassay method as per the protocol given in the RIAK-4A, RIAK-5A and RIAK-9 kits respectively, supplied by BARC, Bombay. Precision of the assays were measured by *cv* (coefficient of variation) value, a measure of random error. Intra-assay variations were 2.5 to 3.2 (acceptable value < 10) and inter-assay variations were 4.0 to 6.1 (acceptable value < 15) in our lab. Mean values observed in the respective age groups were  $1.35 \pm 0.23$ ,

$1.15 \pm 0.17$  and  $0.80 \pm 0.24$  nmol/l for serum  $T_3$ ;  $11.6 \pm 2.9$ ,  $10.92 \pm 1.59$  and  $8.38 \pm 3.94$   $\mu\text{g/dl}$  for serum  $T_4$ ; and  $2.37 \pm 1.8$ ,  $2.97 \pm 2.8$  and  $3.49 \pm 2.48$   $\mu\text{U/ml}$  for serum TSH respectively (Table I). Broadly the values were within the normal range for the lab ( $0.70$ - $1.85$  nmol/l,  $6.0$ - $14.0$   $\mu\text{g/dl}$  and  $0.5$ - $5.0$   $\mu\text{U/ml}$  for serum  $T_3$ ,  $T_4$  and TSH respectively) and the age related changes were statistically insignificant ( $P > 0.05$ ).

Age related changes in serum  $T_3$  are well documented (1, 2). It has been reported to result from reduced peripheral conversion of  $T_4$  into  $T_3$  due to the suppressed 5'-monodeiodinase activity as evidenced by the increase  $rT_3$  levels (3). Serum  $T_4$  usually remains the same (2) or decreases in females and not in males (4). Serum TSH is considered to be the most sensitive marker of the thyroid functions and has been reported to increase (5), decrease (2) or remains unchanged with aging (6). Although statistically insignificant rise in serum TSH levels were observed in our study, 7 out of 42 (16%) of subjects had their TSH levels of  $> 5$   $\mu\text{U/ml}$ , the upper range of normal for the lab. It was comparable to the 14% prevalence in a previous study (5).

Apparent age related changes in thyroid functions thus occur in a community based study even in the absence of concomitant illness or medication. The changes seem to be secondary to the higher prevalence of

TABLE I : Mean serum concentrations of T<sub>3</sub>, T<sub>4</sub> and TSH in different age groups.

Age groups (in years)	No. of subjects	Serum T <sub>3</sub> (nmol/L)	Serum T <sub>4</sub> (µg/dl)	Serum TSH (µu/ml)
40 - 50	14	1.35±0.23	11.6 ± 2.9	2.37± 1.8
50 - 60	14	1.15±0.17	10.92 ± 1.59	2.97± 2.8
60 - 70	14	0.80±0.24	8.38 ± 3.94	3.49± 2.48

autoimmune thyroid disease in the elderly population (6, 7), whereas inadvertent inclusion of elderly individuals with nonthyroidal illness can exaggerate the age related changes in thyroid functions (8, 9), careful exclusion of subclinical autoimmune

thyroid diseases by antithyroid antibody assays prevent most of these age related fluctuations (2, 10). It is the difference in the subset of population being studied which has resulted into the varying reports of age related changes in thyroid functions in the literature.

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#### REFERENCES

- Hansen JM, Skovsted L, Siertaek-Nielsen K. Age dependent changes in iodine metabolism and thyroid function. *Acta Endocrinol (Copenh)* 1975; 79: 60.
- Mariotti S, Babesino G, Caturegli P et al. Complex alteration of thyroid function in healthy centenarians. *J Clin Endocrinol Metab* 1993; 77: 1130-1134.
- Nishikawa M, Inada M, Naito K et al. Age related changes of serum 3, 3'-di-iodothyronine, 3'5-di-iodothyronine and 3,5 di-iodothyronine concentrations in man. *J Clin Endocrinol Metab* 1981; 52: 517.
- Lipson A, Nickoloff EL, Hsu TH et al. A study of age-dependent changes in thyroid hormone tests in adults. *J Nucl* 1979; 20: 1124.
- Sawin CT, Chopra D, Azisi F et al. The aging thyroid. Increased prevalence of elevated serum thyrotropin levels in the elderly. *JAMA* 1979; 242: 247.
- Shetty, Duthie. Anterior pituitary function and GH use in the elderly. *Endocrinol Metab Clin N Am* 1995; 24: 218.
- Finucane P, Anderson C. Thyroid disease in older patients. Diagnosis and treatment. *Drugs Aging* 1995; 6: 268-277.
- Synder PJ, Utiger RD. Response to thyrotropin releasing hormone (TRH) in normal man. *J Clin Endocrinol Metab* 1972; 34: 380.
- Westgren V, Berger A, Ingemansson S et al. Blood levels of 3,5,3'-tri-iodothyronine and thyroxine-differences between children, adults and elderly subjects. *Acta Med Scand* 1976; 200: 493.
- Szabolcs I, Bernard W, Horster FA. Thyroid autoantibodies in hospitalized chronic geriatric patients: prevalence, effects of age, nonthyroidal clinical state and thyroid function. *J Am Geriatr Soc* 1995; 43: 670-673.

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