SERUM T_3, T_4 LEVEL IN INFERTILE WOMEN

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SUMMARY

Serum Tri-iodo-thyronine (T_3) and Thyroxine (T_4) were estimated by Radioimmunoassay (RIA) in 60 non pregnant females with proven fertility, and in 60 infertile women taken randomly. The mean T_3, T_4 levels were found within limits in both the groups. 11 cases (18.33%) of infertile group showed abnormal T_3, T_4 levels (thyroid factor). The incidence is higher in infertile cases associated with secondary amenorrhoea, anovulation, irregular menstruation and habitual abortion.

Introduction

The problem of infertility is as old as civilisation. The relation of thyroid to sex organ is a classical inter-relation and known to mankind since ancient times. The thyroid-gonadal interrelationship is intensely and critically investigated and definate co-relation is established. At present, Radioimmunoassay (RIA) of T_3 and T_4 are appropriate indicators of thyroid functions. The technique is considered to be highly accurate, rapid and easy with almost no known defect.

Material and Method

The study was conducted in the department of Obstetrics and Gynaecology, Gauhati Medical College Hospital during 1987-88.

Control Group

60 non-pregnant clinically euthyroid women having 2 or more children were selected as control cases. They were in the age group of 19-35 years.

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Study Group

In this group, 60 infertile cases were taken at random. 40 of them had primary and 20 had secondary infertility. Among 20 secondarily infertily cases, 4 had habitual abortion. The cases were in the age group of 19-35 years. 35 of these 60 cases had normal menstruation and the remaining 25 had abnormal menstruation like menorrhagia, hypomenorrhoea, menometrorrhagia and amenorrhoea. The infertility cases had a history of barreness of at least 1 year of conjugal life without any use of contraceptive. Husbands semen analysis in all the cases were normal.

Particulars of patient

The history of the patient in relation to marital status, type and duration of infertility, menstrual pattern, complain related to the thyroid status, past obstet-

ric history etc. were taken. The general examination, systemic examination, examination of thyroid gland and gynaecological examination were done.

The cases were subjected to general investigations of infertility. The T_3 and T_4 levels were measured in both the groups.

Techniques: The competitive inhibition of unlabelled antigen in binding of labelled antigen to the specific antibody from the theoretical basis of R.I.A. (Ahuja and Kachupillai, 1983).

Normal range of T_3 is 0.7-2 ng/ml. and T_4 is 5.5-13.5 mcg% (BARC, 1987).

Result

Control group:- The T_3 and T_4 were once estimated in 60 control cases. The mean levels of T_3 and T_4 were within normal limit.

TABLE - I
T_3 AND T_4 LEVEL IN CONTROL GROUP

	Range	Mean	Standard Deviation (S.D.)
T_3 (nanogram/ml)	0.7-2	1.36	0.38
T_4 (micr gm%)	6.10-13	8.86	1.59

All of the control cases had normal values of T_3 and T_4.

Infertile group: The T_3 and T_4 were estimated once in the 60 fertile cases. The mean levels of T_3 and T_4 were within normal limit (Table - II) although the range of variations were wide.

TABLE - II
T_3 AND T_4 LEVEL IN INFERTILE GROUP

Hormones	Range	Mean with S.D.
T_3	0.26-4.9 ng/ml	1.46 ± 0.92 ng/ml
T_4	3.3 mcg%-20 mcg%	8.90 ± 3.28 mcg %

Among 60 infertile cases, 11 had abnormal T_3 and T_4 levels - 4 with high and 7 with low values. Out of these 11 cases. The Clinical menifestiations of hyper or hypothyroidism were seen in 2 and 3 cases respectively. Moreover, 15 cases had borderline T_3 and T_4 levels – 2 with high normal and 13 with low normal values.

Thyroid factor with menstrual disturbances:

There were 25 cases of abnormal menstruation in the infertile group. The T_3 and T_4 level of infertile cases with normal and abnormal menstruation were varied but the difference is not statistically significant (P>0.05) Table -III.

The cases with menstrual disturbances showed more abnormal T_3 and T_4 levels (24%) than cases with normal menstruation (14.28%). The cases with scanty menstruation were more associated with high and high normal T_3, T_4 values. On the other hand, the cases with menorrhagia and menometrorrhagia were more associated with low or low normal T_3, T_4 levels.

Amenorrhoea and thyroid factor: 3 of the 4 (75%) secondary amenorrhoea cases had low T_3, T_4 values. 1 of the 2 primary

TABLE - III

Menstruation	T_3 (ng/ml) Range	T_3 (ng/ml) Mean	T_4 (mcg%) Range	T_4 (mcg%) Mean
Normal	0.3-2.4	1.49±0.53	3.8-20.0	9.70±3.22
Abnormal	0.26-4.9	1.41±0.73	3.3-15.4	8.78±3.50

amenorrhoea cases had low normal T_3, T_4 values. The rest of them (2 cases) had normal T_3, T_4 values.

Anovulation and thyroid factor: Out of 24 cases with anovulation 7(29.1%) had abnormal thyroid hormone level. 2 with high and 5 with low T_3, T_4 levels.

Habitual abortion and thyroid factor: Out of the 4 cases of habitual abortions, 2(50%) had abnormal T_3, T_4 levels - 1 with high and 1 with low values.

Discussion

The abnormalities of thyroid function in infertile cases were studied by various workers by using different indices of thyroid function like Basal Metabolic Rate (BMR) Protein Bound Iodine (PBI), Radioactive Iodine uptake (RAI uptake), Radioimmunoassay (RIA) etc.

Alakananda and Gogoi (1985) studied T_3 and T_4 in infertile cases- the mean T_3 was 1.38 ± 0.40 ng/ml. and mean T_4 was 10.1 ± 4.39 ug%. They had no case with abnormal T_3 and T_4 level, hence the mean differs from the present study.

Litzenberg (1926) Winklestein (1940), Hamblen et al (1941), Nicodemus and Ritmiller (1945) found higher incidence of hypo or hyperfunction of thyroid in infertile women but they used clinical features and BMR to find out thyroid status which were not specific of thyroid functions Comninos (1952) used P.B.I. to assess Thyroid function in infertile cases and found thyroid abnormalities in 15.9% of cases which is comparable to present study. Conway et al (1985) used R.I.A. of T_3, TSH and detected thyroid abnormalities in 1.3% of cases. The difference with the present study may be due to (a) inclusion of only cases with normal menstruation by Conway et al, (b) no goitre endemicity in his study (present study is done in goitre endemic area) and (c) dietary and geographical variation.

Summary

1. The study revealed that the incidence of abnormalities of thyroid hormone (T_3 and T_4) levels in infertile cases (considered as thyroid factor) were significant (18.33%). In this light, it is desirable that the importance of thyroid factor should be kept in mind during the diagnosis and management of infertile cases.

2. There were higher incidence of thyroid factor in infertile cases with clinical features of hyper of hypothyroidism, abnormal menstruation, habitual abortion, secondary amenorrhoea and anovulation. Hence they must be investigated for thyroid function as correction of these condition often improves fertility.

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