CHAPTER II

REVIEW OF LITERATURE

Madeddu G, Mameli P, Giraudi D, et al (1981) studied the pre-ejection period index (PEP-I), total electromechanical systolic index (QS2I), left ventricular ejection time index (LVETI) and PEP/LVET ratio in 35 thyrotoxic patients none of whom had clinical evidence of heart disease nor received drugs which might have affected the STI. They found significant shortening of PEPI and reduction in PEP/LVET. But found no correlation between the serum levels of T3, T4 and the STI. However serial studies showed a return towards normal as the thyroid function improves.

Jeric M, Banovac K. Baric Lj, et al (1982) studied the STI and QKd (interval between the onset of QRS complex and the onset of the Korotkoff arterial sound) in 60 patients with hyperthyroidism. They attempted to correlate these readings with serum T3, serum T4 and free T4 index (FT4I) in these patients and found that hyperthyroid patients had shortening of PEP and Qkd interval. There was also an inverse relationship between the serum T3 and PEP values ($r=-0.738$, $p<0.001$). Significant correlation also existed between serum T3 and QKd values ($r=-0.919$, $P<0.001$). No correlation was found between serum T4 and PEP or QKd.

Ernst L, AanderudS (1982) Studied the STI, the QS2 PEP, LVET PEP/LVET ratio in 10 thyrotoxic patients and found that PEP. intervals and PEP/LVET ratios were significantly decreased ($p<0.01$) and LVET was prolonged ($P<0.001$). No relationship was however found between concentrations of thyroid hormones T3, T4, TSH and the STI.

Friedman MI, Okada RD, Ewy GA et al (1982) studied the systolic and diastolic function of the left ventricle in 13 patients with hyperthyroidism by M-mode echocardiograms and measured the STI by the conventional tripple record technique. All patients were reassessed when they were rendered euthyroid. They found that the PEPI and PEP/LVET ratio were lowered in hyperthyroidism. The left ventricular minor axis fractional shortening and the normalized maximum velocity of shortening were both increased. No linear correlation was demonstrated between hormone levels and these paramters of left ventricular function.

Felt V, Cenkova V, Nedvidkova J (1982) investigated the relationship between left ventricular ejection time (LVET), the pre-ejection period (PEP), the Q-Kd interval and serum T3 level in 184 patients with different grades of thyroid function. Significant inverse correlations between T3 level and the duration of PEP, LVET and Q-kd intervals were found. An inverse relationship with T4 level was found only with Q-Kd interval. They also observed that T4 concentration was

higher in patients with cardiac affection though no statistical correlation was reported.

Germanides J, Souvatzoglow A, Sideris D et al (1984) investigated 105 patients with atrial fibrillation with and without hyperthyroidism by measuring the Q dC. (equivalent to PEP) and dC1-dC2 interval (equivalent to LVET) and determining the serum T4 serum T3, rT3 and TSH. They found that the Q-dc, in the hyperthyroid group was statistically significantly shorter than that of the euthyroid groups while the mean values dc1-dc2 showed no statistically significant difference in both the groups. Regression analysis revealed a statistically significant correlation between Q-dc1 and T4, T3, rT3 ($P<0.001$-0.001).

Mangschau A, Salem JH, Lund-Karlsen R (1985): studied the STI and radionuclide ventriculography in 22 patients with hyperthyroidism before and after antithyroid treatment. STI as well as radionuclide ventriculography showed enhanced myocardial contractility which was normalized after antithyroid treatment. QS2 was low normal, PEPc (PEP corrected for heart rate) was abnormally short resulting in a subnormal PEP/LVET ratio. LVETc (LVET corrected for heart rate) showed no change in this study. No relationship was however demonstrated between serum T3 and serum T4 and STI in these patients.

Cavaliere H, Savioli R, Lima E, et al (1985) investigated the left ventricular performance through the measurement of the systolic time intervals (QS2, LVET, PEP and PEP/LVET ratio) in 8 young adults with congenital goitrous hypothyroidism. all showed lengthening PEP, shortening of LVET and an increased PEP/LVET ratio associated with low serum T3 and T4. STI and PEP/LVET ratio promptly reversed to the normal range with physiologic L-T4 (100 micrograms) or LT-3 (50 micrograms) replacement.

It is apparent from the aforementioned studies that no general agreement exists as to the correlation between the thyroid hormone level in the serum and the indices of left ventricular function. The investigators do agree however, that there is a significant increase in the inotropic and chronotropic states which causes a statistically significant alterations in the left ventricular systolic indices when compared to normal population.