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In Endocrinology

THYROID DISORDERS AND HYPERTENSION

17TH MAY, WE OBSERVED THE WORLD HYPERTENSION DAY AND SOON WE WOULD BE OBSERVING WORLD THYROID DAY, 25TH MAY, LET US HAVE AN UNDERSTANDING OF THE RELATION BETWEEN THE TWO.

ARTERIAL HYPERTENSION REPRESENTS A MAJOR GLOBAL HEALTH CONCERN; MORE THAN ONE FOURTH OF THE POPULATION IS AFFECTED BY HIGH BLOOD PRESSURE. ALBEIT THE UNDERLYING CAUSE OF THE DISEASE REMAINS UNCLEAR IN THE VAST MAJORITY OF THE CASES, ~10% ARE OF SECONDARY ORIGIN. ENDOCRINE DISORDERS MAY LEAD TO ELEVATED BLOOD PRESSURE, AMONG WHICH THYROID DISEASES ARE OF HIGH PREVALENCE AND OFTEN OVERLOOKED, ESPECIALLY IN MILD CASES. OVERT AND SUBCLINICAL HYPER- AND HYPOTHYROIDISM CAN BOTH LEAD TO (MOSTLY MILD) HYPERTENSION. DURING THE PAST DECADES, SOME GENETIC MUTATIONS IN THE HYPOTHALAMUS-PITUITARY-THYROID AXIS WITH CARDIOVASCULAR CONSEQUENCES WERE REVEALED. ATHEROSCLEROTIC CHANGES RESULTING FROM LIPID ABNORMALITIES DUE TO THYROID DYSFUNCTION ALSO AFFECT THE VASCULATURE AND CAN CAUSE ELEVATED BLOOD PRESSURE.

HYPERTENSION AND INCREASED CARDIOVASCULAR RISK IN OVERT HYPERTHYROIDISM

HYPERTHYROIDISM IS ACCOMPANIED BY CARDIOVASCULAR COMPLICATIONS (CARDIAC ARRHYTHMIAS, HYPER COAGULOPATHY, STROKE, AND PULMONARY EMBOLISM) IN A SIGNIFICANT NUMBER OF CASES, LEADING TO AN INCREASE IN SHORT-TERM MORBIDITY AND LONG-TERM MORBIDITY AND MORTALITY.

HYPERTENSION AND INCREASED CARDIOVASCULAR RISK IN SUBCLINICAL HYPERTHYROIDISM

THE LONG EXPOSURE OF THE HEART TO SUBCLINICAL HYPERTHYROIDISM LEADS TO AN ALTERED CARDIAC MORPHOLOGY AND FUNCTION. AS A CONSEQUENCE, LEFT VENTRICULAR FUNCTION CHANGES: SYSTOLIC FUNCTION IS ENHANCED, WHILE DIASTOLIC FUNCTION BECOMES IMPAIRED, A SLOWED MYOCARDIAL RELAXATION IS PRESENT RESULTING IN AN INCREASE OF LEFT VENTRICULAR MASS; AS WELL AS INCREASED HEART RATE AND ARRHYTHMIAS, SUCH AS ATRIAL FIBRILLATION .

ALTHOUGH LIPID PROFILE IS NOT AFFECTED UNFAVOURABLY IN SUBCLINICAL HYPERTHYROIDISM, ENDOTHELIAL DYSFUNCTION AND INCREASED THROMBOGENICITY IS PRESENT

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ATHEROSCLEROSIS AND HYPOTHYROIDISM

THYROID HORMONES AFFECT BIOCHEMICAL AND MOLECULAR MECHANISMS OF LIPID HOMEOSTASIS RESULTING IN A VARIABLE PHENOMENON OF DYSLIPIDAEMIA MOSTLY CHARACTERIZED BY HIGH SERUM CONCENTRATIONS OF TOTAL AND LOW-DENSITY LIPOPROTEIN (LDL) CHOLESTEROL AND NORMAL OR EVEN ELEVATED HIGH-DENSITY LIPOPROTEIN (HDL) CHOLESTEROL LEVELS. FURTHERMORE, HIGH SERUM CONCENTRATIONS OF TRIGLYCERIDES, INTERMEDIATE-DENSITY LIPOPROTEINS, APOLIPOPROTEIN A AND APOLIPOPROTEIN B ARE FREQUENTLY OBSERVED.

BESIDES DYSLIPIDEMIA, CHANGES IN COAGULATION PARAMETERS ARE DESCRIBED IN THYROID DISORDERS BEING PARTLY RESPONSIBLE FOR ATHEROGENIC CHANGES. DECREASED PLATELET COUNT, AGGREGATION AND AGGLUTINATION, VON WILLEBRAND FACTOR ANTIGEN AND ACTIVITY, DECREASED LEVELS OF SEVERAL COAGULATION FACTORS SUCH AS FACTOR VII, VIII, IX, XI, AND PLASMINOGEN ACTIVATOR-1 CAN BE DETECTED IN OVERT HYPOTHYROIDISM LEADING TO HYPERCOAGULABILITY. IN SUBCLINICAL HYPOTHYROIDISM AND AUTOIMMUNE THYROID DISEASE INCREASED FIBRINOGEN LEVEL, FACTOR VII LEVEL AND ACTIVITY, AND PLASMINOGEN ACTIVATOR INHIBITOR-1 LEVEL HAVE BEEN DETECTED RENDERING A TENDENCY TOWARD A HYPERCOAGULABLE STATE

HYPERTENSION IN OVERT HYPOTHYROIDISM

A HIGH PREVALENCE OF DIASTOLIC HYPERTENSION HAD BEEN FOUND IN PATIENTS ABOVE 50 YEARS OF AGE WITH OVERT HYPOTHYROIDISM WHOSE BLOOD PRESSURE WAS NORMALIZED AFTER ADEQUATE THYROID HORMONE REPLACEMENT THERAPY

BLOOD PRESSURE CHANGES IN SUBCLINICAL HYPOTHYROIDISM

THERE IS NOT ENOUGH DATA TO SUPPORT THAT SUBCLINICAL CHANGES IN THE THYROID FUNCTION PRESENT POTENTIAL RISK FOR THE DEVELOPMENT AND MAINTENANCE OF HYPERTENSION.

CONCLUSION

ALTERATIONS OF THYROID FUNCTION MAY RESULT IN CHANGES IN BLOOD PRESSURE VALUES AS WELL AS OTHER TRADITIONAL CARDIOVASCULAR RISK FACTORS, LEADING TO AN INCREASED CARDIOVASCULAR RISK, WHICH IS MILD IN MOST CASES, ALTHOUGH HYPERTHYROIDISM REPRESENTS A SIGNIFICANT ELEVATION OF CARDIOVASCULAR MORTALITY RISK. THE DELAYED CLINICAL RECOGNITION OF SUBCLINICAL FORMS OF THYROID DYSFUNCTION, I.E., SUBCLINICAL HYPO AND HYPERTHYROIDISM HAS UNFAVOURABLE CARDIOVASCULAR EFFECTS. CONCERNING CARDIOVASCULAR RISKS, EARLY DIAGNOSIS, AND

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TREATMENT OF EVEN MILD FORMS OF FUNCTIONAL THYROID DISORDERS MIGHT BE BENEFICIAL IN THE VAST MAJORITY OF THE PATIENTS. HOWEVER, OVERTREATMENT SHOULD BE AVOIDED, AND AGE-RELATED OR INDIVIDUAL VARIANCES OF PITUITARY-THYROID SET-POINTS HAVE TO BE CONSIDERED.

Dr. Minal Mohit