ORIGINAL RESEARCH PAPER
Volume - 10 | Issue - 01 | January - 2021 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

STUDY OF HIGH SENSITIVITY C-REACTIVE PROTEIN LEVELS IN SUBCLINICAL HYPOTHYROID PATIENTS ATTENDING A TERTIARY CARE HOSPITAL

Biochemistry

Dr.D.Sobana* Postgraduate, Department of Biochemisrty, Sree Mookambika Institute of Medical Sciences, Kulasekharam, K.K.District. *Corresponding Author

Dr.M.Mahima Alicia Postgraduate, Department of Biochemisrty, Sree Mookambika Institute of Medical Sciences, Kulasekharam, K.K.District.

Dr.R.Nagendran Professor & HOD, Department of Biochemisrty, Sree Mookambika Institute of Medical Sciences, Kulasekharam, K.K.District.

ABSTRACT

Background: Relationship between subclinical hypothyroidism and cardiovascular disease has been one of the most popular topics recently.The hs CRP is not only an inflammatory marker,but also a stimulator of inflammation and predictor of CVD.The hsCRP indicates the cardiovascular risk associated with SCH. **Aims and objectives:**The aim of the study is to see the difference between hsCRP and Thyroid Stimulating Hormone in SCH. **Materials and methods:**Totally 60 subjects were selected for the study which included 30 cases of SCH and 30 controls with normal thyroid status.**Results:**The mean TSH values were significantly elevated in SCH(7.4±2.9) when compared with controls (1.58±0.78),p value0.0001.Significantly elevated hsCRP was observed in SCH(3.05±1.78) when compared with controls (0.62±0.39),p value<0.0001. **Conclusion:**Elevated levels of hsCRP in SCH suggest inflammation hsCRP was >3mg/L in 7 cases of SCH and 23% of SCH had high risk of developing CVD. as a possible factor for linking SCH and CVD due to that the future risk of further development of cardiovascular disorder can occur.

KEYWORDS

High sensitivity C-reactive protein,subclinical hypothyroidism & cardiovascular disease.

INTRODUCTION:

Subclinical hypothyroidism is a condition associated with mild thyroid dysfunction, with elevated TSH and normal levels of thyroid hormones (FT3-free triiodothyronin& FT4 –free thyroxine)[1] .Subclinical hypothyroidism significantly increases the risk for cardiovascular disease [2] .This emphasizes the need to study the levels of hs-CRP(high sensitivity C-reactive protein) in subclinical hypothyroid patients,since hs-CRP is a predictor of future cardiovascular events.

OBJECTIVES:

- To see the difference between hs-CRP in subclinical hypothyroid patients and controls
- To find an association between hs-CRP & TSH in subclinical hypothyroid patients

METHODOLOGY:

This cross-sectional study was conducted among 60 subjects which included 30 SCH patients and 30 controls. It was conducted in the Department of Medicine, Sree Mookambika Institute of Medical Sciences,Kulasekharam, from August 2019 to October 2019. 30 SCH patients and 30 normal healthy people were included in the study.Patients who take T.Eltroxin for hypothyroidism,who have congestive cardiac failure, inflammatory bowel disease, systemic lupus erythematosus,rheumatoid arthritis, osteomyelitis, fungal infections,bacterial infections were excluded from the study.hs CRP levels were analysed by turbidimetric method in Biosystems analyser in SMIMS Central Laboratory, Department of Biochemistry

Analysis of data:

Ms Excel 2016,Software version 16.0 used.

RESULTS:

Parameter	SCH	Controls	p-value
TSH(µIU/ml)	7.4±2.9	1.5±0.7	0.001
FT4(ng/dL)	1.16±0.25	1.15±0.22	NS
hsCRP(mg/L)	3.05±1.78	0.62±0.39	<0.001
FT3(ng/dL)	0.327±0.03	0.340±0.05	NS

The mean TSH levels of SCH were significantly higher than that of the controls. Significantly, higher levels of the hsCRP were observed in SCH when compared with controls..Risk stratification of CVD for hsCRP as recommended by the American Diabetes Association (ADA),Centre for Disease Control and Prevention (CDC) and National Academy of Clinical Biochemistry(NACB) eaperts is <1,1 to 3,>3mg/L for low, moderate and high risk of developing CVD respectively.In this present study, among SCH patients,8 (24%),15 (53%) and 7(23%) are at low,moderate and high risk of developing CVD respectively.

DISCUSSION:

In this present study, mean for TSH in cases is 7.4±2.9 than that of the controls (1.5±0.7) with a p value of 0.0001 which is statiscally significant.The mean for hsCRP in cases is 3.05±1.78 than that of the controls with a p value of <0.0001 which is statiscally significant. hsCRP is an inflammatory marker and a strong predictor of CVD [3] .SCH is a condition of sympathetic,vagal imbalance and increased sympathetic and decreased vagal activities are associated with low-grade inflammation.So,hsCRP is elevated in SCH. hsCRP is elevated due to overall low metabolic rate in SCH,slower uptake of hsCRP in target cells and decreased rate of clearance[4] .Subclinical hypothyroidism can be associated with increased risk of coronary artery disease,peripheral vascular disease and biochemical abnormalities such as increased LDL-C levels and increased serum triglycerides[5].

Thyroid hormone has a great impact on lipid metabolism as it is needed for the synthesis and catabolism of lipids.hsCRP can interfere with endothelial function directly by downregulation of endothelial nitric oxide synthase[6] . hsCRP probably participates directly in the pathogenesis of atherosclerosis through activation of endothelial cells and coronary artery smooth muscle cells[7] .hsCRP rapidly increases in cases of inflammation and tissue damage. hsCRP is a marker of the underlying pro-inflammatory process of atherosclerosis and a strong predictor of cardiovascular risk[8] . Subclinical hypothyroidism is diagnosed when TSH levels are greater than 5mIU/L and less than 10mIU/L.hsCRP binds to the phosphocholine expressed on the surface of dead or dying cells and some bacteria.This activates the complement system,promoting phagocytosis by macrophages ,which clears necrotic and apoptotic cells and bacteria.It plays a role in innate immunity as an early defence system against infections.Patients with subclinical hypothyroidism have altered lipid parameters that leads to development of atherosclerosis which has serious consequences like development of Coronary artery disease and stroke[9] .There is an increase in the activity of factor X and more atherogenic lipid profile in subclinical hypothyroid patients. Thyroid hormone deficiency at cellular level may induce a lack of energy and may lead to chronic cellular inflammatory process[10].

CONCLUSION:

It is concluded that SCH patients are associated with inflammatory markers that may result in the development of cardiovascular risk.

REFERENCES:

1. Sapna Vyakaranam,Sindhu Kondaveedu Srinivas Nori,Shilendra Dunge,Aparna V. Bhonjir,"Study of serum high sensitivity C-reactive protein in subclinical hypothyroidism",Indian J.Med.Biochem 2018:22(1)66-70
2. Gaurav Gupta,Preeti Sharma,Pradeep Kumar,Maliyannar Itagappa,"Study on subclinical hypothyroidism and its association with various inflammatory markers",Journal of Clinical and Diagnostic Research,2015 vol(9-11),BC04-BC06
3. Sindhumala,Sateeshkumar,Kumari Priyanka,Zahir Ali Sheikh, "Serum inflammatory markers in Subclinical hypothyroidism",ejpmr,2017,4(90,855-859
4. Esen Saras,Ahmet ziya Sahin,Sefika Nur Aksoy,Ayse Tasacn,Mesut oz kaya, "Serum levels of inflammatory markers in patients with thyroid dysfunction and their association with autoimmunity status",Int J Clin Exp.Med 2016:9(2) 4485-4490
5. Manisha Panchal,Umesh B.Gondaliya,"A study of high sensitive c-reactive protein in subclinical hypothyroidism",International journal of contemporary Medicine Surgery and Radiology,2019:4(1):A85-A87
6. Khaled A-Hefnarry,Hanaa Hosni Elsaid,"Assessment of some inflammatory markers and lipid profile as risk factors for atherosclerosis in subclinical hypothyroidism",Egypt J.Intern .Med.2019:31:115-21
7. Peixoto de Miranda, Bittercourt Santos,Lotafo,"Thyroid function and high sensitivity c-reactive protein in cross-sectional results from the Brazilian longitudinal study of Adult Health: Effect of adiposity and insulin resistance", Eur.Thyroid j 2016:5:240-246
8. Satya Devi Uppu,Madhur Gupta,J.Datta ,"Association between c-reactive protein and interleukin-6 levels in subclinical hypothyroid patients",Inst.Med. Sci.Univ 2018:13:195-8
9. Rajendra KC,Saroj Khatiwala,Kishun Deo Mehta,Pratikshya Panday,Shankar Majhi,"Cardiovascular risk factors in subclinical hypothyroidism:A case control study in Nepalese population"Journal of Thyroid Research volu:2015,Article ID 305241,5 pages
10. Mohammed Hossein Shojaei Nik,Masnid Darabi,Amir Ziaee,Fatemeh Hajmanoochekii,"Serum phospholipase A2-II A,hsCRP and lipids in women with subclinical hypothyroidism",Int J Endocrinol Metah,2014,Jul,12(3):e 16967