

Prothrombin Time: Relation with Hyperthyroidism in Early Stage

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Abstract: ***Aim:** To study the level of prothrombin time in relation to hyperthyroidism in early stage. **Subjects & Method:** Fifty two patients based on inclusion and exclusion criteria and their coagulation profile i.e. Prothrombin time, aPTT and INR were studied in the present study. **Result and Conclusion:** In the present study 53.8% patients have slightly raised prothrombin time which concluded that there might have a bleeding tendencies in early stage of hyperthyroidism.*

Keywords: Hyperthyroidism, Prothrombin time, aPTT and INR

1. Introduction

The data reported in the literature indicate that disturbances of hemostasis are common phenomena in patients with thyroid diseases. These abnormalities range from subclinical laboratory findings to clinically significant coagulopathies and, more rarely, major hemorrhagic or thromboembolic complications.¹⁻⁶ Although it has been generally agreed that patients with hypothyroidism have a bleeding tendency whereas patients with hyperthyroidism are at risk of thromboembolic events,³ the more recent literature data have evidenced that the interaction between thyroid disorders and hemostasis is more complex than initially believed. The first time a relation between thyroid disorder and hemostatic system was described in 1913 by Kaliebe. He described a patient with Graves' disease and cerebral venous thrombosis and proposed a relation between thyroid hormone and venous thrombosis which was subsequently published by Squizzato et al.⁷ Subsequent studies focused on alterations in levels of coagulation factors in patients with thyroid disease and mostly confirmed that hyperthyroidism was associated with prothrombotic changes.⁸⁻¹² Even though the exact mechanism is still unproven, the most suggested one is by increasing Von Willebrand factor (vWF) and coagulation factor VIII levels.^{8,10} Bleeding tendencies also reported in hyperthyroidism with probable mechanism of platelet dysfunction or development of autoimmune thrombocytopenia.^{13,14} Coagulation tests in patients with thyroid hormone deficiency usually show a prolongation of the partial thromboplastin time (PTT) and a normal or slightly shortened prothrombin time (PT), which reflect the abnormalities of the related coagulation factors.¹⁵⁻¹⁸

2. Materials and Methods

The study was conducted in medicine department in LN Medical college and JK hospital kolar road, Bhopal. Fifty two patients who were first diagnosed to be hyperthyroidism with duration of symptoms range from 6 months to 2 yrs present in the medicine department were studied. In the present study, those patients who does not have any comorbid conditions after having proper history and

thorough clinical examination were included and those who are not on any drugs or diseased state were excluded. After clinical examination and laboratory confirmation of hyperthyroidism by thyroid profile we have send the coagulation profile i.e. Prothrombin time, aPTT and INR of the patients and compare with TSH in the present study.

3. Results

In the present study, 53.8% patients have slightly raised prothrombin time and INR and aPTT were found to be normal in the early stage of hyperthyroidism who does not have any comorbid conditions and not on any pills (e.g. blood thinners agents).

4. Discussion

In the present study we use the parameter prothrombin time and INR and aPTT and found that there is a slight increases in PT and INR which suggest there might have risk of bleeding in early stage of hyperthyroidism although none of the patient of bleeding was found in our study as compare to the Kurata Y et al. study¹³ in which there is bleeding tendencies in hyperthyroidism with probable mechanism of platelet dysfunction and also compare with the Cordiano I et al. Study¹⁴ where bleeding tendencies in hyperthyroidism is due to auto immune thrombocytopenia.

In the present study, there is a slight increase in prothrombin time and INR where as aPTT is normal which contradict the study of Mohammed Ali¹⁹ and Thoyyib M.²⁰

Mohammed Ali et al.¹⁹ observed a significant decrease in PT in hyperthyroid patients compared to the control group. Activated thromboplastin time was also significantly decreased in hyperthyroid patients, compared to the control group in the same study.

Thoyyib M et al.²⁰ Also observed a significant decrease in PT in hyperthyroid patients compared to the control group. Activated thromboplastin time was also significantly decreased in hyperthyroid patients

In other study of Myrup B et al.² they studied primary hemostasis in hyperthyroid and hypothyroid patients and, among the parameters analyzed (bleeding time, platelet count, b-2 macroglobulin, fibrinogen, fibronectin, platelet aggregation and agglutination), Similar results were reported by the study of Rogers JS et al.^{11,21} and Gullu S et al.²²

5. Conclusions

Although bleeding tendencies are common with hypothyroid and very rare with hyperthyroidism but in the present study there is slight increase in prothrombin time and INR, which concluded that patients might have a bleeding tendencies in early stage of hyperthyroidism which needs further evaluation with more number of cases and more other parameters of coagulation.

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