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ORIGINAL ARTICLE

Prevalence of Thyroid Dysfunction in Chronic Hepatitis C Patients on Interferon Therapy

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ABSTRACT

Objective: to record the prevalence of thyroid dysfunction in chronic HCV cases receiving interferon therapy

Methodology: A total of 100 patients with a diagnosis of chronic Hepatitis C between 35-70 years of either sex with normal Thyroid function test at the time of commencement of therapy were included. This trial was conducted during the period 2021-22 at Services Hospital Lahore. Interferon alfa 3 million units were administered to patients three times per week, along with oral ribavirin 1000 mg or 1200 mg every day (depending on their weight) for 24 weeks. During therapy, these individuals had clinical evaluations every 2, 4, and 6 months. The presence and severity of adverse events were evaluated at each visit, along with standard laboratory tests. TSH levels were used to assess patients for thyroid illness every 2, 4, and 6 months.

Results: Mean age was calculated as 48.57+11.35 years, 52(52%) were male and 48(48%) were females, frequency of thyroid dysfunction in Chronic HCV cases receiving interferon therapy was recorded in 19(19%) of the cases.

Conclusion: The incidence of thyroid dysfunction in individuals taking interferon treatment for chronic hepatitis C infection is not very high. However, we recommend that those who are currently receiving treatment for chronic hepatitis C should be evaluated for thyroid dysfunction.

Keywords: Chronic Hepatitis C infection, Interferon therapy, Thyroid Dysfunction,

INTRODUCTION

Based on prior research findings, it has been determined that the hepatitis C virus is responsible for causing acute hepatitis in approximately 15-20% of cases, followed by chronic infection in approximately 50-80% of cases [1]. In addition, it has been observed that approximately 20% of individuals with chronic hepatitis C will experience the development of cirrhosis, a potentially fatal complication. Moreover, cirrhotic patients have been found to have an annual incidence rate of 4-5% for hepatocellular carcinoma (HCC) [2-4].

It has been found that hepatitis C is associated with a wide variety of autoimmune diseases, such as thyroid disease, rheumatoid arthritis, cryoglobulinemia, immune thrombocytopenic purpura, Sjogren's syndrome, and systemic lupus erythematosus [5]. Furthermore, there is always the chance that serious issues may arise. Antonelli et al. [6] found that patients with chronic hepatitis C had a higher frequency of thyroid autoimmune diseases, and this was true even in the absence of cirrhosis, HCC, or interferon treatment.

The utilisation of interferon alpha has been extensively employed in the management of persistent Hepatitis C viral infection. Interferon alpha is commonly administered via subcutaneous or intramuscular injections. Thyroid dysfunction is a prevalent endocrine manifestation of chronic hepatitis C infection, which can be further intensified by interferon-based therapy.[6] The thyroid disease spectrum encompasses a variety of conditions, including the generation of solitary anti-thyroid antibodies, as well as dysfunctions such as Graves' disease, hypothyroidism, and destructive thyroiditis.[7]

The administration of INF alpha therapy for Hepatitis C Virus (HCV) treatment has been found to result in thyroid changes or dysfunction in approximately 6% of the patients who undergo the treatment. The majority of adverse reactions associated with interferon are a result of its impact on the immune system. Evidence indicates that, apart from its immunomodulatory mechanism, interferon also triggers thyroiditis through direct thyrotoxicity.[8] Ribavirin, a nucleoside analogue, exhibits a wide range of antiviral activity against both RNA and DNA viruses. Additionally, it has the potential to induce thyroid disease through an autoimmune mechanism, either independently or in conjunction with interferon, while also potentially stimulating the immune system.[9] The incidence of thyroid abnormalities is higher in patients who receive combination therapy of INF alpha and RIB (12.1%) compared to those who are treated with INF alpha monotherapy (6.6%).[10]

The therapeutic services and resource allocation may be planned more effectively when we know the scope of any condition. It was decided to do this research since there are known differences in the prevalence/incidence of thyroid dysfunction during interferon treatment between geographic regions, and a search of the literature turned up no similar report from this location. The purpose of my research is to establish a regional baseline for the diagnosis of thyroid dysfunction throughout treatment with interferon and ribavirin for individuals with chronic hepatitis C.

METHODOLOGY

The study comprised a sample of one hundred patients, of both sexes, aged between 30 and 70 years, who had been diagnosed with chronic Hepatitis C and had normal thyroid function test results at the onset of therapy. Exclusion criteria for the study included patients presenting with co-infection of Hepatitis B virus and HIV, pre-existing thyroid disease, decompensated cirrhosis, neoplastic conditions, severe cardiac or pulmonary disease, other comorbidities, and severe depression or other psychiatric disorders. The individuals who tested positive for anti-HCV were confirmed using polymerase chain reaction to detect HCV RNA. The patients who met the criteria underwent a comprehensive evaluation of their thyroid, including a thorough medical history and physical examination. Prior to commencing therapy, the thyroid profiles of patients who were diagnosed with HCV were assessed at Mayo Hospital's CENUM laboratory in Lahore. The treatment regimen involved the administration of interferon alfa at a dose of 3 million units three times per week for a duration of 24 weeks, along with oral ribavirin at a dose of 1000 mg per day for individuals weighing 75 Kg or less, and 1200 mg per day for those weighing more than 75 Kg. The individuals underwent clinical assessments at regular intervals of 2, 4, and 6 months. Adverse events were assessed for their frequency and severity, while standard laboratory tests were conducted during each visit. The TSH levels of the patients were monitored at regular intervals of 2, 4, and 6 months to detect any indications of thyroid dysfunction. Descriptive statistics were employed to quantify the prevalence of thyroid dysfunction among chronic Hepatitis C patients undergoing interferon treatment. The median and standard deviation of the age distribution were

calculated. The rates of thyroid dysfunction and their distribution by gender were presented.

RESULTS

The mean age was determined to be 48.57+11.35 years, 52 (52%) of the patients were male cases while 48 (48%) of the patients were female, and the incidence of thyroid dysfunction in patients with chronic hepatitis C infection who were getting interferon treatment was observed in 19 (19%) of the cases.

Table 1:

Variables		Thyroid dysfunction		P value
		Yes	No	
Age(years)	30-50	9	39	0.95
	51-70	10	42	
Gender	Male	11	41	0.57
	Female	8	40	
Duration of hepatitis (years)	1-2	6	66	0.00013
	>2	13	15	

DISCUSSION

The present investigation was designed to ascertain the prevalence of thyroid dysfunction, with the aim of enhancing our ability to strategically plan clinical services and allocate resources.

In our study, mean age was calculated as 48.57+11.35 years, 52(52%) were male and 48(48%) were females, 19(19%) cases had thyroid dysfunction receiving interferon therapy. Our findings are consistent with a prior investigation conducted in Rawalpindi, which reported a prevalence rate of 18.7% for the same magnitude.[11]

Our results are not consistent with those obtained in earlier research, which found prevalence rates of 7.3%15, 25%,[12] and 4% in a study that was carried out in another study.[13]

When we compared our results to those of Dalgard et al., they discovered that thyroid dysfunction affected 11.8% of patients, whereas Kee et al.,[14] discovered that it affected 12.6% of patients.

The aforementioned data indicate that Interferon (IFN)-based therapy, recognised for its ability to trigger, expose, or intensify diverse autoimmune conditions, is likely responsible for the development of thyroid dysfunction (TD) in patients with chronic hepatitis C (CHC).

Interferon treatment is not often associated with an increased risk of developing thyroid function abnormalities. They might, on the other hand, be the cause of its demise before its natural time. It is essential that the potential of the condition be taken into consideration, especially in cases in which the patient experiences weight loss and/or hair loss, as well as reports of irritability, emotional imbalance, memory difficulties, general weakness, or impaired exercise tolerance, and the patient also mentions these symptoms. These issues, which are often blamed on the effects of IFNa and RBV, are in reality early signs of thyroid illness.

Even though thyroid dysfunction is not an absolute contraindication for antiviral medication, euthyreosis should be established prior to starting the therapy. Patients going into therapy who already have TPOAb antibodies should get additional care and attention. Patients need to have careful supervision during the treatment since there is a possibility that they may develop thyroid malfunction. To properly prepare a patient with thyroid pathology for antiviral medication and to guarantee that therapy is carried out in a safe manner, only close collaboration between the physician who is administering the therapy and an endocrinologist is necessary.

The fact that we did not include a control group in our trial consisting of people who did not have hepatitis C as a way to evaluate the progression of TD in these participants was a limitation of the study. In the research conducted by Floreani et al.[15] and Marazuela et al., a relationship between untreated chronic HCV infection and the development of TD was not found.

We aimed to determine the frequency of thyroid dysfunction in chronic hepatitis C patients who were undergoing interferon therapy and establish baseline data for this region. Taking into consideration the regional variations in the prevalence and incidence of thyroid dysfunction during interferon therapy, as well as the lack of studies that are relevant to this area, this study was conducted to accomplish these objectives.

CONCLUSION

The incidence of thyroid dysfunction in individuals taking interferon treatment for chronic hepatitis C infection is not very high. However, we recommend that those who are currently receiving treatment for chronic hepatitis C should be evaluated for thyroid dysfunction.

REFERENCES

1. Li HC, Lo SY: Hepatitis C virus: virology, diagnosis and treatment. World J Hepatol 2015;7:1377-89.
2. Alberti A, Chemello L, Benvegnù L: Natural history of hepatitis C. J Hepatol. 1999, 31:17-24.
3. Hoofnagle JH: Course and outcome of hepatitis C. Hepatology 2002;36:S21-9.
4. Chen SL, Morgan TR: The natural history of hepatitis C virus (HCV) infection. Int J Med Sci. 2006, 3:47-52.
5. Jadali Z, Alavian SM: Autoimmune diseases co-existing with hepatitis C virus infection. Iran J Allergy Asthma Immunol 2010;9:191-206.
6. Antonelli A, Ferri C, Pampana A, et al.: Thyroid disorders in chronic hepatitis C. Am J Med 2004; 117:10-3.
7. Tran HA, Reeves GE. The spectrum of auto immune thyroid disease in the short to medium term following interferon alpha therapy for chronic hepatitis C. Int J Endocrinology. 2009;16:241-86.
8. Tomer Y, Menconi F. Interferon induced thyroiditis. Best Pract Res Clin Endocrinol Metab. 2009;43:637-44.
9. Antonelli A, Ferri C, Fallahi P. Hepatitis C: thyroid dysfunction in patients with hepatitis C on INF Therapy. Nat Rev Gastro Hepatol 2009;6:633-5.
10. Tran HA, Reeves GE. The influence of Hepatitis C infection and interferon alpha therapy on thyrotropin blocking and stimulating autoantibodies in Graves ophthalmopathy: a case report. Thyroid Res 2009;2:12-14.
11. Nadeem A, Aslam M. Association of interferon-Alpha and Ribavirin-induced Thyroid Dysfunction with severity of disease and response to treatment in Pakistani Asian Patients of Chronic Hepatitis C. Hepat Res Treat. 2012;2012:864315.
12. Chuadhry N Ghayur S, Sattar A, Hashim R, Ijaz A and Khan FA. Thyroid Dysfunction induced by recombinant interferon-alpha therapy for chronicactive type C Hepatitis. Pak Armed Forces Med J. 2011;7:46-52.
13. Mahmood K Muhammad N. side effects of combination of interferon plus Ribavirin therapy in patients with chronic hepatitis C; an experience with 400 patients. JpMI 2007;21:187-91.
14. Kee KM, Lee CM, Wang JH, Tung HD, Changchien CS, Lu SN, et al. Thyroid dysfunction in patients with chronic hepatitis C receiving a combined therapy of interferon and ribavirin: incidence, associated factors and prognosis. J Gastroenterol Hepatol 2006; 21 (1 pt 2): 319-26.
15. Floreani A, Betterle C, Carderi I et al. Arsita-one Research Group. Is hepatitis C virus is a risk factor for thyroid autoimmunity? J. Viral Hepat. 2005; 13: 272–7.