

Frequency of Hypothyroidism in HCV Positive Patients at Chandka Medical College Teaching Hospital Larkana

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ABSTRACT

Objective: To determine the frequency of hypothyroidism in hepatitis C patients presenting to tertiary care Hospital.

Study Design: Case Series study

Place and Duration of Study: This study was conducted at the Medical Unit-I Chandka Medical, Larkana from January 2019 to July 2019.

Materials and Methods: The study was conducted on patients following inclusion and exclusion criteria and ethical approval and informed consent. The blood samples for TSH, T3 and T4 levels were sent to the laboratory of Larkana Institute of Nuclear Medicine and Radiotherapy (LINAR).

Results: Our results have shown that some 4 (4.9%) patients were diagnosed as hypothyroid patients, being more common in females and younger age.

Conclusion: We propose a massive epidemiological study not only to gather the relevant data but also focusing on some of the factors and reasons for co existence of hypothyroidism and HCV. HCV patients should also provided information regarding side effects of its treatment, among which is most commonest is hypothyroidism.

Key Words: Hepatitis C, Hypothyroidism, Epidemiology, Association.

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INTRODUCTION

Hypothyroidism is an endocrine disorder due to decrease production of thyroid hormones. It has a preponderance to age, sex and race. Hepatitis C virus (HCV) is a small enveloped positive strand RNA virus classified in the Hepacivirus genus within the Flaviviridae family.⁰¹ Chronic hepatitis C virus (HCV) infection can lead to both hepatic and extrahepatic dysfunction and endocrine dysfunction is also one of the extrahepatic feature.² With chronic hepatitis C infection around 80% of infected patients leads to chronic liver disease, and hepatocellular carcinoma. Infected blood or blood products are common route for Hepatitis C spread from person to person. One of the speculated mechanism with association of chronic HCV infection with endocrine diseases is through a type 1 T-helper-cell mediated immune response.³

In one of the case control study the HEP C infected controls had higher thyroid stimulating hormone (TSH) and lower free T3 and free T4 levels, than did uninfected controls.⁴ In another study HCV-infected patients had hypothyroidism secondary to autoantibodies like anti-thyroid peroxidase or anti-thyroglobulin autoantibodies of (13%) than controls (3-5%).² With chronic HCV infection a high prevalence of hypothyroidism was observed with higher prevalent autoimmunity.^{5,6} Another evidence of immune thyroid disease due to HCV virus infection was observed due to production of anti-thyroid autoantibodies.^{1,2} A study from India conducted on pregnant women who were anti-HCV antibody positive some 16.7% had abnormal thyroid-stimulating hormone (TSH) and (13%) with overt thyroid disease 5% sub-clinical thyroid disease.⁷ Type 1 T-helper cell pattern of cytokine expression and activation via interferon-gamma provides the clue towards association of autoimmune thyroid disease secondary to Hepatitis C. Chronic hepatitis C includes all type of thyroid dysfunction i.e. hypothyroidism, hyperthyroidism, Hashimoto's disease and isolated increases in anti-thyroid autoantibodies.² As compared to hepatitis B or hepatitis D, chronic hepatitis C had higher prevalence of thyroid disorders and thyroid autoantibodies than in control series.² Considering the all above evidences of associations, very few studies have been conducted in Pakistan and little international data available. Considering the prevalence of hepatitis C in Pakistan especially villages the importance of our

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study increased many folds. It is of utmost importance to conduct a massive prevalence studies in the area so that the required data can be gathered to solve these two combined issues. In our study hypothyroidism was observed in 13% of the HCV positive patients. So anti HCV positive patients should be periodically screened for thyroid dysfunction.

MATERIALS AND METHODS

The study was conducted in Department of Medicine Medical Unit-I and Endocrine ward, Chandka Medical College after fulfilling the criteria for inclusion and exclusion. After clearance from ethical review committee, a written informed consent was obtained from patients respectively. The blood samples were drawn for serum TSH, T3 and T4 levels and were sent to the laboratory of Larkana Institute of Nuclear Medicine and Radiotherapy (LINAR). Using kit IMMUNOTECH by Beckman Coulter company by immuno radiometric assay (IRMA) and radio immunometric assay (RIA) for TSH, T3 and T4 respectively by. A proforma was designed and filled with these variables along with demographic information and results of the blood tests for hypothyroidism.

Data Analysis: Version 17 of SPSS was used to enter the data. Descriptive statistics was used to summarize the categorical and continuous data. Frequencies and percentages was computed for the gender, hypothyroidism in hepatitis C. The mean \pm S.D was calculated from continuous data. Age, duration of diseases and gender stratification done to see impact of these variables on outcome.

Operational Definition:

Hepatitis C Patients: Patients were labeled Hepatitis C positive, who had anti HCV anti bodies detected by ELISA.

Hypothyroidism: Patients were labeled hypothyroid, who had serum TSH > 7.1 mIU/ml (normal 0.4 mIU/ml to 7.1 mIU/ml), decrease T3 < 2.5 pmol/l (normal 2.5 pmol/l – 5.8 pmol/l) and T4 < 11.5 pmol/l (normal 11.5 pmol/l to 23 pmol/l) levels in serum.

Inclusion Criteria: All the patients of age more than 12 years of either sex having anti HCV anti body positive, detected by second generation ELISA method.

Exclusion Criteria: All patients fulfilling the below criteria were excluded from study.

1. Patients treated for Hepatitis C with interferon and ribavirin
2. Iodine deficiency
3. Post partum thyroiditis
4. History of thyroidectomy
5. Iatrogenic (radioactive iodine therapy for hyperthyroidism)

Patients taking drugs like amiodarone, thalidomide and lithium were also excluded from the study.

RESULTS

In this study a total number of 103 patients were enrolled after fulfilling the inclusion criteria. The mean age of the patients were 37.43 ± 9.04 years with age range between 19 to 58 years. The proportion of males were higher of 73 (70.9%) as compare to the proportion of female that was 30 (29.1%). The maximum number of patients were thirty six (35.0%) falling in age between 31 to 40 years of age. Fifty one (49.5%) patients had duration of anti HCV antibody positive between 6 to 12 months while 28 (27.2%) patients were duration of anti HCV antibody positive more than 12 months. Hypothyroidism was observed in 5 (4.9%) patients who were positive for Anti HCV antibody. When compared the gender with duration of HCV more male 37 (50.7%) patients was observed with duration of HCV 6 to 12 months. Similarly female 4 (13.3%) patients with hypothyroidism compared with male 1 (1.4%) patients. When age is compared with duration of age we found 19 (52.8%) patients between 6 to 12 months, two (5.6%) patients were found less than 6 months and eight (22.2%) patients more than 12 months. 3 (9.4%) patients were found with hypothyroidism between the age group of 21 – 30 years.

Table No.1: Age, mean \pm ST-Deviation

| | N | Minimum | Maximum | Mean | Std. Deviation |
|-----|-----|---------|---------|-------|----------------|
| Age | 103 | 19 | 58 | 37.43 | 9.035 |

Table No.2: Age distribution

| Age group | Frequency | Percent |
|--------------|------------|--------------|
| <21 years | 1 | 1.0 |
| 21-30 years | 32 | 31.1 |
| 31-40 years | 36 | 35.0 |
| 41-50 years | 24 | 23.3 |
| >50 years | 10 | 9.7 |
| Total | 103 | 100.0 |

Table No.3: Distribution of duration of HCV

| Duration of HCV | Frequency | Percent |
|-----------------|------------|--------------|
| Not Known | 21 | 20.4 |
| < 6 Months | 3 | 2.9 |
| 6-12 Months | 51 | 49.5 |
| > 12 Months | 28 | 27.2 |
| Total | 103 | 100.0 |

Table No.4: Frequency of Hypothyroidism

| Hypothyroidism | Frequency | Percent |
|----------------|------------|--------------|
| Present | 5 | 4.9 |
| Absent | 98 | 95.1 |
| Total | 103 | 100.0 |

Table No.5: Comparison of gender according to Anti HCV Antibody Positivity

| Sex | Since Anti HCV Antibody Positivity Duration | | | | Total |
|--------|---|-------------|---------------|---------------|-----------------|
| | Not Known | < 6 Months | 6-12 Months | > 12 Months | |
| Male | 11 (15.1%) | 2 (2.7%) | 37 (50.7%) | 23 (31.5%) | 73 (100.0%) |
| Female | 10 (33.3%) | 1 (3.3%) | 14 (46.7%) | 5 (16.7%) | 30 (100.0%) |
| Total | 21 (20.4%) | 3 (2.9%) | 51 (49.5%) | 28 (27.2%) | 103 (100.0%) |

Table No.6: Comparison of gender according to Hypothyroidism

| Sex | Hypothyroidism | | Total |
|--------|----------------|---------------|-----------------|
| | Present | Absent | |
| Male | 1 (1.4%) | 72 (98.6%) | 73 (100.0%) |
| Female | 4 (13.3%) | 26 (86.7%) | 30 (100.0%) |
| Total | 5 (4.9%) | 98 (95.1%) | 103 (100.0%) |

Table No.7: Comparison of Age According to Duration of Anti HCV Antibody Positivity

| Age group | Duration since Anti HCV Antibody Positivity | | | | Total |
|-------------|---|-------------|---------------|---------------|-----------------|
| | Not Known | < 6 Months | 6-12 Months | > 12 Months | |
| <21 years | 0 (0%) | 0 (0%) | 1 (100.0%) | 0 (0%) | 1 (100.0%) |
| 21-30 years | 7 (21.9%) | 0 (0%) | 17 (53.1%) | 8 (25.0%) | 32 (100.0%) |
| 31-40 years | 7 (19.4%) | 2 (5.6%) | 19 (52.8%) | 8 (22.2%) | 36 (100.0%) |
| 41-50 years | 3 (12.5%) | 1 (4.2%) | 10 (41.7%) | 10 (41.7%) | 24 (100.0%) |
| >50 years | 4 (40.0%) | 0 (0%) | 4 (40.0%) | 2 (20.0%) | 10 (100.0%) |
| Total | 21 (20.4%) | 3 (2.9%) | 51 (49.5%) | 28 (27.2%) | 103 (100.0%) |

Table No.8: Comparison of Age According Hypothyroidism

| Age group | Hypothyroidism | | Total |
|-------------|----------------|------------|-------------|
| | Present | Absent | |
| <21 years | 0(0%) | 1 (100.0%) | 1(100.0%) |
| 21-30 years | 3(9.4%) | 29(90.6%) | 32(100.0%) |
| 31-40 years | 1 (2.8%) | 35 (97.2%) | 36 (100.0%) |
| 41-50 years | 1 (4.2%) | 23 (95.8%) | 24 (100.0%) |
| >50 years | 0 (0%) | 10(100.0%) | 10(100.0%) |
| Total | 5 (4.9%) | 98 (95.1%) | 103(100.0%) |

DISCUSSION

Hypothyroidism is an endocrine disorder resulting from decreased production of thyroid hormones. Autoimmune hypothyroidism is linked with chronic hepatitis C infection. Our results have shown that the some 14 patients (11.1%) found to be hypothyroid, out of which 9 (9.6%) hypothyroid were male and 5 hypothyroid (15.6%) were female.

Like our study, many conducted studies have shown the nearly same association of hypothyroidism and hepatitis

C of 15.3% which is 1% higher than our study. An Indian study conducted for determination of the incidence of thyroid abnormality in pregnant women with hepatitis C virus (HCV) infection, found 13 women (16.7%) had abnormal thyroid-stimulating hormone (TSH) of >5 mIU/L in hypothyroid group.⁵

A retrospective study from Peshawar (Pakistan) of 9054 patients with thyroid problems, showed 4% and 5.4% of hypothyroid and subclinical hypothyroid frequency in adult group which is slightly different from our study showing more in old age group and women.¹⁰ A comparative study was done in 630 patients with hepatitis C to determine its association of with thyroid disorders, which included a control group of 389 and 268 subjects from an iodine-deficient area and iodine sufficient area, and third group of 86 subjects with chronic hepatitis B. The results found that chronic hepatitis C patients 13% patients had hypothyroid 38% patient had thyroid antibodies than rest of the groups.³

A study from Greece showing the incidence and features of thyroid disease, and to identify its outcome in treated and untreated chronic hepatitis C patients. Out of some 94 patients with chronic hepatitis C 11 found to be hypothyroid and 2 hyperthyroid, which subsequently landed to hypothyroidism.⁶

As compared to study conducted in Sindh Pakistan for determining the frequency of thyroid abnormalities with interferon and ribavirin treatment of chronic hepatitis C, 84.6% patients out of 100 had hypothyroidism and 15.3% pts had hyperthyroidism⁷ which is inferior to our study in relation to define cause and outcome where interferon treated patients are in exclusion criteria.⁸

A study from Italy on auto immune thyroid abnormalities in a cohort of untreated children with vertically acquired, chronic, HCV infection, showed that 11.1% HCV-infected children suffered subclinical hypothyroidism.⁹

A study from Poland for frequency determination of thyroid abnormality (TD) during antiviral treatment of chronic hepatitis C (CHC). Thyroid dysfunction occurred in 40 patients (33.3%), more often in women than in men, which is similar to our study 15% female and 96% male,¹¹ though its age statics showed no differences where as our study showed positive findings in old age group. The range of thyroid antibodies was 4.6 to 15% in chronic Hepatitis C infection.¹²

A retrospective performed on 94 patients with Chronic Hepatitis C by Vezali et al.¹³ to evaluate thyroid function for the development of autoimmune thyroid diseases. The sum 33 patients were in control group as compare to 61 patients in treatment group who received had treatment with PEG-IFN- plus ribavirin. After the follow up of 80.1 and 39.4 months duration, 13 (21.3%) patients on PEG-IFN- plus ribavirin had 13 patients developed thyroid disorder out of which 11 had hypothyroidism.¹²

A UK based study showed higher frequency of

antibodies against chronic hepatitis C from France in autoimmune thyroid patients. A 16 patients comes out to be anti HCV antibody positive in 46 autoimmune thyroid disease.¹⁴

Our study results have shown in line prevalence of hypothyroidism in HCV than the international world. This is due to the proposed factors are not related to socio cultural and underdeveloped and ill developed facilities and institutions have no role on this association.

The results of our study would provide a strong rationale where from other studies could built their hypothesis and massive epidemiological studies. Our study results would also provide the health policy makers and decision bodies to pursue this as an issue in our country. So that this combined epidemic could be controlled.

CONCLUSION

The study concluded that in the sample of HCV patients some patients were diagnosed as hypothyroid, being more common in female and at younger age. The prevalence of hypothyroidism is in line with other studies conducted internationally. Also international studies has shown similar predisposition for females like our study. On the basis of our findings we would propose a massive epidemiological study not only to gather the relevant data but also focusing on some of the factors and reasons for co existence of hypothyroidism and HCV. We also propose that HCV patients should also provided information regarding side effects of its treatment, among which is most commonest is hypothyroidism.

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