

A Clinical Study of Dequervains Thyroiditis with Special Emphasis on its Relation with Novel Covid-19 Infection- Ourexperience in a Teaching Hospital in North India

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Abstract

Background: Among different types of clinical thyroiditis, Dequervain's thyroiditis is a specific entity. It is triggered by viral infection in genetically susceptible individuals. There is a relative increase in the incidence of COVID – 19 related Dequirevains's thyroiditis in the current running pandemic.

Materials & Methods: This present study is a prospective observational study of 14 patients. The study period was 18 months i.e. from January 2020 to August 2021. It was conducted in ENT department of our teaching hospital in northern India. All patients with painful thyroid swelling and associated systemic features like fever, myalgia, breathlessness were evaluated.

Results: On analysing the data, it was found that 78.6 % were female patients and 21.4 % were males. Female: Male ratio was 3:6:1. Mean age was 35.7 Years. Urban: rural ratio was 2:5:1.

Conclusion: From the present study, we conclude Dequirevain's thyroiditis is not an uncommon entity causing painful thyroiditis. Multiple viruses including COVID – 19 is known for it causation. Now a days, more urban population is affected than rural. Data is lacking with regard to relation between other forms of clinical throiditis and novel covid-19. Further research is needed in this aspect.

Keywords: Thyroiditis, Covid-19, viraemia, spike protein.

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Introduction

Any inflammation of thyroid gland is termed as thyroiditis. Different types of thyroiditis described in the medical literature. Hashimotos thyroiditis, Dequervainsthyroiditis, Riedel's thyroiditis, postpartum thyroiditis are a few to mention [1].

There is rise in the incidence of thyroiditis in recent years, especially hashimotos thyroiditis and Dequervains thyroiditis. This is due to the combination of genetic factors and environmental factors. Curiously, there is increase in the incidence Dequervains thyroiditis due to novel covid-19 infection caused by SARS Covid-19 [2].

Dequervains thyroiditis was first described in 1904. Other names of this clinical condition are giant cell thyroiditis, pseudogranulomatous thyroiditis, subacute non-suppurative thyroiditis and struma granulomatosis. It is named after Fritz De quervain who was swiss surgeon. He was also responsible for introducing iodized salt in order to prevent goitre.

Hashimoto's thyroiditis is the most common type among all types of thyroiditis. It is also called chronic lymphocytic thyroiditis. Hakaru hashimoto, Japanese physician described this clinical entity in 1912.

Riedel's thyroiditis is known as fibrosing thyroiditis. It is rare disease characterized by chronic inflammation and fibrosis. It belongs to a spectrum of Ig G4 – related disease.

It is named after Bernhard Riedel. He first described this clinical condition in 1883. Silent thyroiditis is the third and the least common variety of thyroiditis. It was not noticed till 1970s. It shows features which is a combination of Hashimoto's thyroiditis and Dequervains thyroiditis. Most of the patients are young women in reproductive age group.

Post-partum thyroiditis is a rare and temporary condition. It affects 5% of women during the year after birth. Women with type – I diabetes and thyroid dysfunction are at higher risk to develop post – partum thyroiditis.

Drug induced thyroiditis is a recent entity which became popular in recent years. Drugs like amiodarone, lithium, interferons, cytokines, sorafenib, thalidomide are found to be causing thyroiditis.

In recent years, number of patients presenting with dequervains thyroiditis and Covid -19 infections were more in our ENT department. So we took up this present clinical study relating the above two clinical conditions.

Aims and Objectives

1. To study age pattern, sex pattern and demographic features of dequervains thyroiditis patients in our Teaching Institute.
2. To analyse any association between novel COVID-19 infection and dequervainsthyroiditis.

Materials and Methods

This present study is a prospective observational study of 14 patients. The study period was 18 months i.e. from January 2020 to August 2021. It was conducted in ENT department of our teaching hospital in northern India. All patients who attended ENT OPD with thyroid swelling and associated neck pain, difficulty in swallowing and breathing were evaluated systematically. Detailed clinical history and clinical examination of each patient's were done. After informed consent, each patient were evaluated by thyroid function test, USG neck, indirect laryngoscopy, x-ray chest, FNAC and anti-thyroid antibody test.

Inclusion Criteria

- Age group between 20-65 years.
- patients without previous history of thyroid surgeries.
- Covid-19 positive patients with neck pain & associated thyroid symptoms.

Exclusion Criteria

- Age below 20 yrs and above 65 years.
- Patients already on thyroid hormone supplementation therapy.
- Patients who underwent thyroid surgeries earlier.
- patients with systemic disorders like diabetes, hypertension, bronchial asthma.

Finally all reports were correlated to know the pattern of Dequervains thyroiditis; its age distribution, sex distribution and demographic pattern in our institute.

Most of the patients of dequervains thyroiditis were managed conservatively. Few patients presented with significant thyroid nodule were undergone hemithyroidectomy or subtotal thyroidectomy as a surgical modality of treatment.

Results:

From present study, we found that most common age group of dequervains thyroiditis was 31-40 years (57.1%). Mean age was 35.7 years.

Out of 14 patients, 11 were females (78.6%) and 3 were males (21.4%). F: M ratio was 3.6:1. One patient was found to be covid-19 related subacute thyroiditis. 12 patients were treated conservatively, while 2 were undergone hemithyroidectomy as treatment. In our study, 71.4% patients were from urban background. Urban: Rural ratio was 2.5:1. No recurrence was noticed in our study.

All results are shown in table 1 to table 3.

Table 1: Age distribution

Sl. no.	Age group	No. of patients	Percentage
1	20-30	2	14.28%
2	31-40	8	57.14%
3	41-50	3	21.42%
4	51-60	1	7.14%
5	61-65	0	0%

Table 2: Sex distribution

Sl. no.	Sex distribution	No. of patients	Percentage
1	Male	3	21.42%
2	Female	11	78.57%

Table 3: Demographic distribution

Sl. no.	Region	No. of patients	Percentage
1	Urban	10	71.4%
2	Rural	4	28.6%

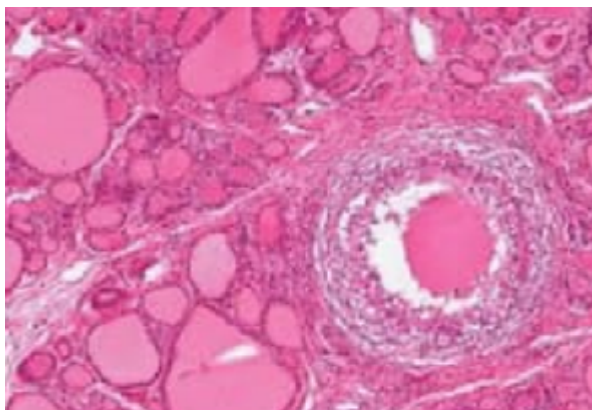


Figure 1: Histopathological picture of subacute thyroiditis

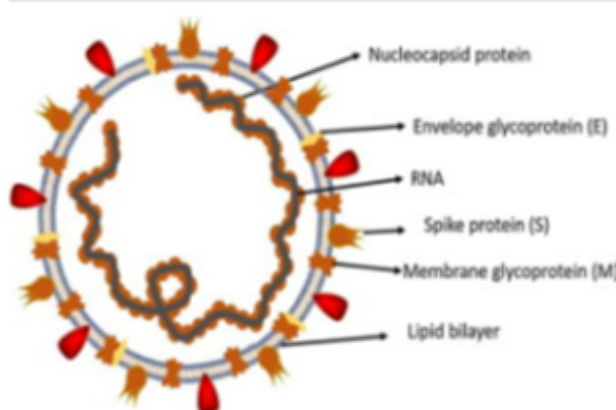


Figure 2: picture of corona virus

Discussion

The word Thyroid developed from a Greek word-meaning *shield*. A butterfly shaped gland sits on the front of neck. It weighs about 15 to 25 grams in adults. Thyroid gland is 5 x 3 x 2cm in dimension. It develops from thyroglossal duct, during 3rd to 7th weeks of gestation.

This clinical condition was first described by Fritz Dequervain in 1904. The incidence rate of Dequervain's thyroiditis is 12.1 per 100,000/year. Mainly young and middle aged individuals are affected with female pre-ponderance. Disease frequency decrease with increasing age [3,4]. In our study, 78.57% patients were females. Age group 31-40 years showed maximum number of patients i.e. 57.14%.

Subacute thyroiditis is one of the major cause painful thyroid disorders. It results from the release of preformed thyroid

hormones. It generally occur 2-8weeks after viraemia in genetically susceptible individuals. It has strong association with HLAB35 [5].

The exact pathogenesis of subacute thyroiditis is not yet clear. The proposed mechanism is that cytotoxic T cell recognition of viral complex and cell antigens, that leads to thyroid follicular cell destruction and its pathogenesis.

Histopathological features in early phase shows neutrophil aggregation, destruction of thyroid follicles and colloid depletion. In late phase of the disease, non caseating granulomas surround follicles and engulf colloid and leading to fibrosis [figure1].

Covid – 19 is lethal infectious disease caused by severe acute respiratory syndrome corona virus – 2 (SARS – CoV-2). It started in wuhan, China in December 2019. Is quickly speard world over,

leading to the current covid – 19 pandemic. The incubation period of covid – 19 is 2 – 14 days. Duration of illness is usually 5 – 7 days. It can take chronic course also.

The usual symptoms noticed are fever, cough, fatigue, loss of smell and loss of taste. Nearly one – third of multiorgan dysfunction syndrome.

Till date, world over approximately 61 crores of people are affected do to covid – 19 infection. 65 lakhs deaths has happened globally. Coming to Indian statistics, 4 crores of people has been infected and the death toll is nearly 5.2 lakhs. The incidence of novel covid-19 induced subacute thyroiditis appears to be increasing in this current pandemic scenario. To best of our knowledge, current literature shows 10 cases of subacute thyroiditis due to present running covid-19 pandemic caused by SARS COVID-2 [6,7]. In our 14 cases of subacute thyroiditis of 18 months, one case was noticed to have a link with present covid-19 infection.

Our patients were diagnosed with covid-19 infection by RT-PCR test. After 3 weeks she developed neck pain with thyroid swelling which was tender. No breathlessness or dysphagia was noticed in our patient. USG Neck showed heterogeneous nodule of 1x2 cm² on the left lobule. Anti-thyroid antibodies were negative. Low TSH values were noticed with raised T3, T4 values. Raised ESR and CRP values were contributory to the diagnosis of subacute thyroiditis.

Apart from Covid-19 virus, adeno virus, measles virus, mumps virus, coxsackie virus, epstein-bar virus, influenza and enterovirus are the other viruses commonly noticed in the causation of subacute thyroiditis [8]. Relationship between novel covid-19 infection and subacute thyroiditis could be due to increased expression of angiotensin converting enzyme 2 and trans membrane protease serine 2 levels in thyroid gland than in lungs and other parts of human

body. These receptors act as key routes of virus entry in susceptible individuals. Altered immune response and cytokine activation might be the reason to provoke thyroiditis [9].

The novel coronavirus disease 2019 [COVID-19] is a highly transmissible and pathogenic viral infection caused by Severe Acute Respiratory Syndrome Corona Virus 2 [SARS-COV-2]. Corona virus belongs to the Corona Viridae family in the Nidovirales order. It has got crown-like spikes on its outer surface; so named as Corona virus. It is minute in size [65-125 nm in diameter]. It has got single stranded RNA as genetic material, size ranging from 26 to 32kbs in length (figure 2).

Corona viruses contain specific genes in ORF1 regions that encode specific proteins for viral replication, nucleocapsid and spikes formation [10]. It is noticed that the receptor-binding domain (RBD) is loosely attached among virus, so the virus may infect multiple hosts simultaneously [11,12]. The entry mechanism of corona virus is based upon cellular proteases like human airway trypsin-like protease [HAT], cathepsins and trans membrane protease serine 2 [TMPRSS2]. Corona virus require angiotensin-converting enzyme 2 [ACE2] as a key receptor for its activation [13,14]. Both local thyroid destruction as well as central mechanisms play a role in its pathogenesis due to novel COVID-19 [15,16].

There are four phases in the natural history of subacute thyroiditis-hyperthyroid phase, transient asymptomatic euthyroid phase, hypothyroid phase and euthyroid phase as recovery. Duration of each phase is nearly 4-6 months [17].

The diagnosis of subacute thyroiditis is mainly clinical, supported by relevant investigations. Thyroid function tests, ESR, C-reactive proteins are must investigations in arriving at correct diagnosis. Serum thyroglobulin levels are

mostly elevated due to follicular damage [17].

Ultrasonography of thyroid is helpful in assessing the size, echogenicity and vascularity of the gland. Technetium pertechnetate [^{99m}Tc] thyroid scan helps to confirm the diagnosis. The main aim of treatment is to alleviate extreme neck pain and reducing thyrotoxic symptoms. Mild to moderate neck pain is managed with NSAIDs. Severe pain may be needed steroids [18]. Hyperthyroid features can be best treated with beta-blocker like propranolol till free T4 level becomes normal. [19]

Conclusion

From our present study, we conclude Dequervains Thyroiditis is not an uncommon disorder causing painful thyroiditis. This clinical condition is noticed mainly among females between 30 to 45 age group. Relatively more urban population is affected than rural. Dequervains thyroiditis is a virus associated subacute thyroiditis. Multiple viruses including Covid-19 is known for its causation. Curiously, novel covid-19 pandemic has got some relation to this clinical entity. Data is lacking for any relation between other forms of clinical thyroiditis and covid-19. Further research is needed in this aspect.

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Compliance with Ethical Standards

Ethical Approval:- The permission was taken from Institutional Ethics Committee prior to starting the project.

All procedures performed in studies involving human participant were in accordance with the ethical standards of the institution and /or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. The ethical committee number is: U/2020/01/16.

Informed Consent: Informed consent was obtained from all individual participants included in the study.

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