

# Evaluation of Subacute Thyroiditis: Frequency, Clinical Manifestation and Laboratory Findings

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## Research Article

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# Abstract

**Introduction:** Subacute thyroiditis (SAT) is a type of viral thyroiditis, which is often a self-limiting illness, but it causes diagnostic mistakes due to a number of clinical symptoms and leads to inappropriate treatment. In this study, clinical, laboratory and demographic findings of patients have been investigated

**Methods:** This descriptive cross-sectional study was performed on 40 patients (27 female-13 male) with subacute thyroiditis during one year. Data included age, sex, clinical symptoms (fever, sore throat, otalgia, fatigue, sweating ...) and laboratory findings. (ESR, CRP, TSH, T4 and WBC). Their files were extracted and analyzed with SPSS.

**Results:** In this study, 67% of the patients were women with the mean age of  $38.48 \pm 8.7$ . Female to male ratio was 2.7 to 1. The most common clinical symptoms were fever (57.5%) and sore throat (55%). Laboratory findings: ESR, TSH, T4 and WBC with average of 67.32, 0.283, 15.368 and 12.456, respectively. CRP positive in 80% of patients who underwent this test. 80 percent of the patients responded to the treatment. The recurrence rate was estimated 42% and 11% for those who received NSAIDs and Prednisolone, respectively

**Conclusion:** In this study, SAT was most prevalent in women in their fourth decade of life. Clinical symptoms were consistent with most studies in terms of prevalence and incidence. There was no significant association between the age and sex of the patients and their clinical manifestations and laboratory results from laboratory considerations, low concentrations of TSH, high levels of ESR and positive CRP were found to be helpful in diagnosis. Prednisolone proved to be more effective in treating SAT.

## Background:

Subacute thyroiditis (SAT) also known as Quervain's thyroiditis, the most common cause of pain of the thyroid gland is mostly caused by the viral infections of the upper respiratory tract. SAT, mostly occurring during the 4th and 5th decades of life is more frequent in females, with a female-to-male ratio of 3–5:1 (1 & 2 ) Symptoms mostly include neck pain, malaise, low grade fever and myalgia(3.). Diagnosis of subacute thyroiditis is made by combining the patients' clinical findings with the laboratory tests results such as Thyroid function test, WBC, ESR and CRP(4). SAT initially manifests with Hyperthyroidism due to the cell destruction and the release of pre-made enzymes followed by hypothyroidism as a result of total depletion of the enzymes(5,6,7 ). Treatment includes Non-Steroidal Antiinflammatory Drugs for mild to moderate SAT and corticosteroids for the severe cases(8, 9, 10). This cross-sectional study aimed to determine the frequency of the clinical and laboratory findings with regards to the gender and age, the rate of improvement as well as recurrence in patients with subacute thyroiditis in Bushehr City in Iran, year of 2018.

## Material And Methods:

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# Populations

In this cross-sectional study we investigated the documents of 40 patients with the diagnosis of subacute thyroiditis who sought consult at the endocrinology and infectious diseases clinics in Bushehr City in Iran from March 2017 through February of 2018.(Table1) Inclusion criteria included sings, symptoms and paraclinical findings of subacute thyroiditis. Patients with the diagnosis of other types of thyroid disease were excluded.

Table 1  
Baseline characteristics in patients with subacute thyroiditis

Variable	Subgroup	Quantity	Frequency (%)
Gender	Male	13	32.5
	Female	27	67.5
Occupation		6	15
	Self-employed	8	20
	Teacher	2	5
	engineer	2	5
	Not-assessed	22	55

## Methodology

In order to gather the data of the patients, a checklist was designed which contained the patients' age, sex, occupation, clinical symptoms (fever, sore throat malaise, perspiration and otalgia), Laboratory findings (TSH, T3, T4, WBC,ESR and CRP), medications and the evidence of recurrence of the disease.

Data analysis was done utilizing AVOA(post hoc:Tykey), Independent t test and Chi square using SPSS ver.22 software. Level of significance was set at 0.05

## Results:

### Clinical symptoms

The study population was composed of both genders (27 females and 13 males ie. Females 67.5%) with a female to male ratio of 1:2.07. The age of the patients ranged from 22 to 53 years with the mean age of  $47 \pm 8$ .

Based on the results, the most common symptoms were fever (57.5%), and neck pain (55%) at the time of consultation. Other symptoms such as malaise, otalgia, weakness and perspiration were also seen. Otagia (27%) and perspiration (10%) had the lowest frequencies among the reported symptoms. Figure 1

Table 2 shows the relationship between the clinical symptoms of the patients with subacute thyroiditis and the age of these patients

As shown in Table 2, there was no significant relationship between the age of the patients and their symptoms

Table 2  
relationship between the clinical symptoms and the age of the patients

<b>Variable</b>	<b>B</b>	<b>S.E</b>	<b>EXP(b)</b>	<b>df</b>	<b>P value</b>
Fever	-1.328	1.505	0.265	1	0.378
Sore throat	0.301	1.454	1.351	1	0.836
Malaise	-1.049	1.500	0.350	1	0.484
Weakness	4.743	2.436	114.782	1	0.052
Perspiration	1.785	2.359	5.962	1	0.449
Otalgia	-0.517	1.585	0.595	1	0.744

We also investigated the association between the patients' gender and their symptoms and the results showed no significant relationship between these two, as seen in Table 3.

Table 3  
association between the patients' gender and their symptoms

Variable	Subgroup	Quantity	F(%)	P value
Fever	Male	7	53.8	0.378
	Female	16	6	
Sore throat	Male	6	26.2	0.836
	Female	16	59.3	
otalgia	Male	2	15.4	0.484
	Female	9	33.3	
perspiration	Male	3	23.1	0.052
	Female	1	23.1	
Malaise	Male	5	38.5	0.449
	Female	10	37.0	
weakness	Male	1	7.7	0.744
	Female	6	22.2	

## Laboratory findings

The average for TSH, T3, T4 and WBC was 0.283, 1.31, 15.368 and 12.456, respectively. CPR was positive in 83% of the patients who underwent this test. Concentrations of the TFT parameters was consistent with that finding in the first phase of the disease. This was accompanied with mild leukocytosis and also mild increase in erythrocyte sedimentation rate, expected on the onset of the disease.

As seen in the Table 4, there was no significant relationship between the age of the patients and their symptoms

Table 4  
association between laboratory  
test results and the age of the  
patients

Variable	R	P value
WBC	0.095	0.580
T3	0.182	0.318
T4	0.061	0.718
TSH	-0.124	0.445
ESR	-0.136	0.404

## Treatment

Patients' data indicated that 29 patients were given prednisolone and the remaining 11 patients were treated with NSAIDS.

## Discussion:

Subacute thyroiditis is viral-induced thyroid inflammation which results in destruction of thyroid follicles and formation of granules. Symptoms includes tender goiter, fever, sore throat, otalgia, malaise and perspiration. Laboratory test shows increase in ESR, CRP and WBC which may mislead to misdiagnosis of viral pharyngitis.

This cross-sectional study conducted on 40 patients with the diagnosis of subacute thyroiditis who sought consult at endocrinology and infectious diseases clinics during 12 months starting March of 2018. The patients' information (age, gender, occupation, clinical signs and paraclinical findings) were extracted from their medical documents and were analyzed subsequently using SPSS.

The analysis of the results showed no significant association between the patients' age and gender and their symptoms at the time of consultation.

Subacute thyroiditis has been reported more frequently in women in the previous studies (11, 12, 13)). The majority of the patients in the current study were female (67.5%) and the ratio of femal to male was approximately 2.07: 1

Subacute thyroiditis followed by a viral infection may result in misdiagnosis of viral pharyngitis (14). Sore throat (76.8%) has also been reported as the most common symptom (15). Fever (57.5%) and sore throat (55%) as the most common symptoms shown in our results supported their report. However, in some studies, fever has been reported in minority of patients (16) In addition to fever, otalgia and transient hematuria were found in patients with subacute thyroiditis (17)Our patients showed no signs and symptoms of hematuria and only 27.5% of them complained of otalgia.

Different reports has been done on sings of thyrotoxicity in more than 60% of their population (16, 18). On the other hand we witnessed changes in the thyroid function test of all of our patients. This was in accordance with the findings of these investigations. Hyperthyroidism in this phase can be explained by the release of pre-made thyroid hormones in the serum of the patients. This differences can be due to the time of consultation, as some patients may show normal findings. Mild increase in WBC and ESR indicates the benign Leukosytosis and inflammatory process occurring in SAT. We also evaluated the association of the patients' age with their laboratories findings. There were no evident significant association between these two.

Our results showed the superiority of prednisolone as the choice of treatment for subacute thyroiditis. 80 percent of the patients responded to the treatment. The recurrence rate was estimated 42% and 11% for those who received NSAIDs and Prednisolone, respectively. Similarly, based on comparison studies done in china (2013–2016), and also in Japan (2017), prednisolone manifested higher efficacy in treating patients with subacute thyroiditis(19, 20). However, some investigations have reported a 20% rate of recurrence in their patients treated with Prednisolone in 2013 in Japan (21).

## Conclusions:

As shown in the results, most of the patients with subacute thyroiditis are in the 4th decade of their lives and in accordance with resent studies, SAT is more frequent if females. The most common symptoms are fever, sore throat and malaise, therefore SAT should be taken into consideration as a differential diagnosis in the presence of these symptoms. The change of thyroid function test in favor of hyperthyroidity are expected which indicated the thyroxicity phase of SAT and should be differentiated from other causes of thyroid disease.

There was no significant association between the patients' age and gender and their clinical symptoms and also no evident relationship between their age and paraclinical findings. Lastly, the response to treatment is considerable with prednisolone and NSAIDS, however prednisolone proved to be superior in the treatment of subacute thyroiditis.

## Declarations:

### Authorship contribution statement:

#### KamranMirzaei:

Conceptualization, Methodology, Formal analysis,Investigation, Data curation, Writing - original draft, Visualization

#### Mohammadreza kalantarhormozi:

Conceptualization, Resources, Writing - review& editing, Supervision

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Writing - original draft,

**farhad Abbasi:**

principal investigator, Resources, Data curation, review & editing.

**Marziyeh Bagheri:**

Resources, review & editing. Bagher Larijani: review & editing.

**Manizhe mohamadi:**

Resources, Data curation, Writing - review & editing.

**Conflict of Interest :** The authors declare that have no conflict of interest.

**Ethical Approval:** The ethics committee of Bushehr University of medical sciences approved the study. It was conducted in agreement with the declaration of Helsinki and Iranian national guidelines for ethics in research. The written informed consent was obtained from all participants prior to study enrolment. Participation was voluntary and each participant could withdraw consent at any time without any consequences. The data collected are stored in a re-identifiable form by national id code.

**Consent to Participate :** All the participants in the study were included after provision of informed written consent

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## Figures

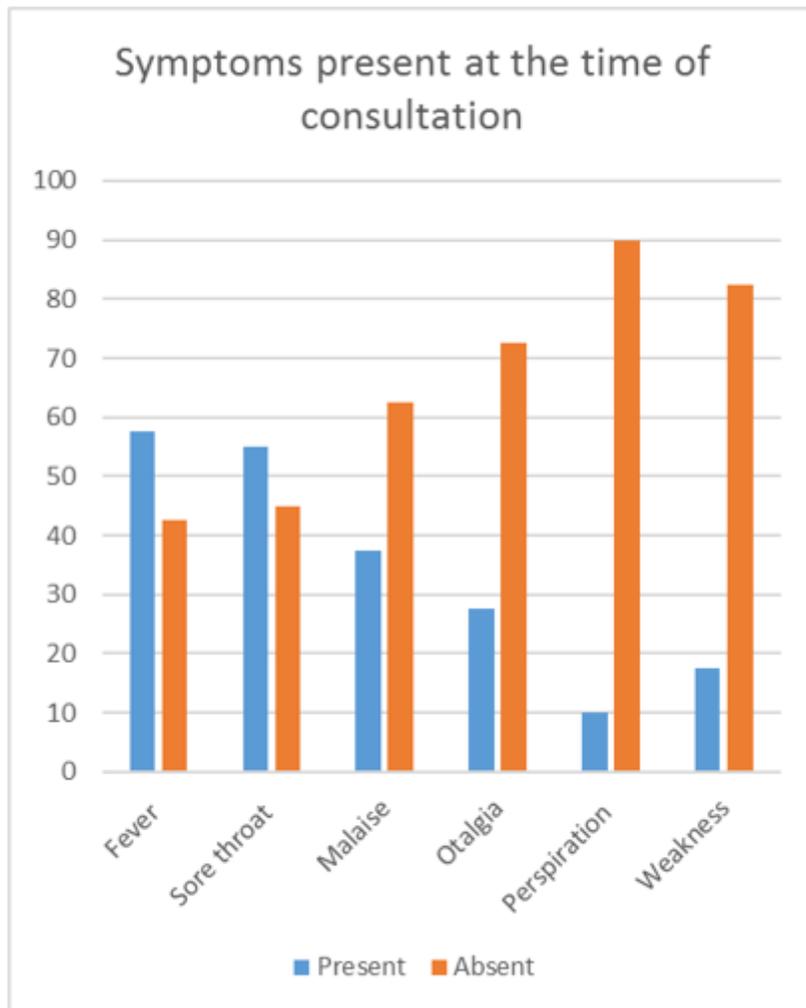


Figure 1

Frequency and clinical manifestation