

Incidence Of Laryngopharyngeal Reflux In COVID-19 Patients

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Abstract: Introduction SARS-COV-2 causing COVID19 is more transmissible because of two main reasons, which include its ability to bind with receptors of host cell and other being viral load in COVID-19 positive patients which is higher, specifically in throat and nose after developing symptoms. Laryngopharyngeal reflux (LPR) is defined as the reverse flow of abdominal contents into the oropharynx and or nasopharynx and larynx. Recent studies on COVID 19 have documented that LPR may be related with this viral infection. No previous studies have documented incidence of LPR. Our study was an effort to establish the incidence of LPR in COVID 19 positive hospital patients.

Aim of the study

The aim of the study was to evaluate the incidence of laryngopharyngeal reflux (LPR) in hospitalized Covid-19 patients using Reflux symptom index.

Methodology

This was a prospective study conducted in tertiary care centre on 402 Covid-19 patients who were hospitalized with minimal symptoms & clinically stable, between April 2020 to July 2020. All 402 patients were assessed for the symptoms of laryngopharyngeal reflux using Reflux symptom index questionnaire (RSI). Reflux symptom index value of more than or equal to 13 is indicative of laryngopharyngeal reflux

Result and discussion

Among 402 patients 102 of them had RSI ≥ 13 , among which 54 were males and 48 were females. In our study 16.6% (n=17) were between the age of 20-30 years, 23.5% (n=24) between 31-40 years, 20.5% (n=21) between 41-50 years, 25.4% (n=26) between 51-60 years, 9.8% (n=10) between 61-70 years and 3.9% (n=4) in 71-80 years. The most common symptom being foreign body sensation in throat followed by post nasal drip & clearing throat mucus. 41.1% (n=42) of the study group had onset of symptoms on 3rd day of being tested positive for COVID 19

Conclusion

This study helped to assess the incidence of LPR in COVID19 positive patients. COVID19 medications, altered dietary and lifestyle habits, stress levels might be a reason for this.

KEYWORDS: COVID19; Laryngopharyngeal reflux; Incidence; Reflux symptom index; RSI

1. INTRODUCTION:

A pandemic caused by coronavirus, originated from China, in the city of Wuhan, has spread to many countries. Coronavirus cases are being reported in the whole world. SARS and COVID-19 disease both are caused by coronavirus.^[1] These two diseases show effect on

respiratory system and has caused major outbreaks. SARS-COV-2 results in COVID-19 disease. SARS-COV-2 is a sarbecovirus which belongs to orthocorona virinae subfamily.^[2] It measures about 65-125nm in size. It is a positive sense RNA virus and single stranded which is non-segmented and enveloped. Its outer surface has crown like projections. SARS-COV-2 is more transmissible because of two main reasons, which include the ability of SARS-COV-2 to bind with receptors of host cell and other being viral load in COVID-19 positive patients which is higher, specifically in throat and nose after developing symptoms.^[3]

Laryngopharyngeal reflux (LPR) is defined as the reverse flow of abdominal contents into the oropharynx and or nasopharynx and larynx.^[4] Most common symptoms of LPR include dryness of throat, foreign body sensation in the throat, change in voice, difficulty in swallowing, dry cough, sensation of lump in throat and breathing difficulty. It is also associated and interrelated with other diseases like rhinitis, otitis media, sinusitis and asthma.^[5] Laryngopharyngeal reflux is considered as a subtype of GERD (Gastro Oesophageal Reflux Disease). They both differ in the frequency of occurrence of heartburn and frequent throat clearing. Throat clearing is seen most commonly in LPR whereas heartburn is seen in 80% of patients with GERD. LPR is also involved in causing some serious effects like aspiration, bronchitis, pneumonitis.^[6]

There are four main barriers which prevent the healthy individual from getting laryngopharyngeal reflux. It includes upper oesophageal sphincter, lower oesophageal sphincter, epithelial resistance factors, oesophageal peristalsis. Defects in any of the above four mechanisms result in reverse flow of abdominal contents to larynx, oropharynx and or nasopharynx.^[7] Recent studies on COVID 19 have documented that LPR may be related with this viral infection. No previous studies have documented incidence of LPR. Our study was an effort to establish the incidence of LPR in COVID 19 positive hospital patients.

2. AIM OF THE STUDY

To evaluate the incidence of laryngopharyngeal reflux (LPR) in hospitalized Covid-19 patients using Reflux symptom index.

3. METHODOLOGY:

This was a prospective observational study conducted from April 2020 to July 2020 after obtaining clearance from Institutional ethical committee. A total of 402 patients were included in the study by convenient sampling method who satisfied the inclusion criteria.

Inclusion criteria:

1. Patient who were tested positive for COVID19 by RT PCR method
2. Patients more than 18 years of age
3. Category A patients (given by institution infection control department)

Exclusion criteria:

1. Previous history of LPR
2. Patients who come under category B and C
3. Other surgical/ structural abnormalities of GIT
4. Syndromic patients

CATEGORY-A which included patients with pulse rate between 60 to 100/min, SBP>120mmhg, DBP>80mmhg, RR<18/min SPO2>94% in room air with no comorbidities,

CATEGORY-B which included patients with pulse rate of 100-120/min, SBP of 100-120mmhg, DBP 70-80mmhg, SPO2 88-94% oxygen, with diabetes mellitus, hypertension, tuberculosis, chronic obstructive pulmonary disease. Pao2/Fio2 300-500, pneumonitis on chest X-ray/ground glass opacities on CT chest

CATEGORY-C included pulse rate >120/min, SBP<100mmhg, DBP<70mmhg, respiratory rate >24/min, SPO2<94% with oxygen Pao2/Fio2 <300. This classification was given by Infection Control Committee of our tertiary care centre.

Reflux symptom index ^(8,9)

(RSI) questionnaire was given to study population on day of admission and were asked to grade from 0-no symptoms to 5-severe symptoms. The same form was filled by the study population on day 3,7,10,14, given in table 1. Patients who had RSI more than or equal to 13 were given proton pump inhibitors and dietary changes. All the results were collected and evaluated.

TABLE-1 RSI INDEX

Sr. No.	Parameter	Day 1	Day 3	Day 7	Day 10	Day 14
1	Hoarseness or problem with your voice					
2	Clearing your throat frequently					
3	Excess throat mucous or postnasal drip					
4	Difficulty in swallowing food, liquids, pills					
5	Coughing after you ate or after lying down					
6	Breathing difficulties or choking episodes					
7	Troublesome or annoying cough					
8	Sensations of something sticking in your throat or a lump in your throat					
9	Heartburn, chest pain, indigestion, or stomach acid coming up					
10	Total score					

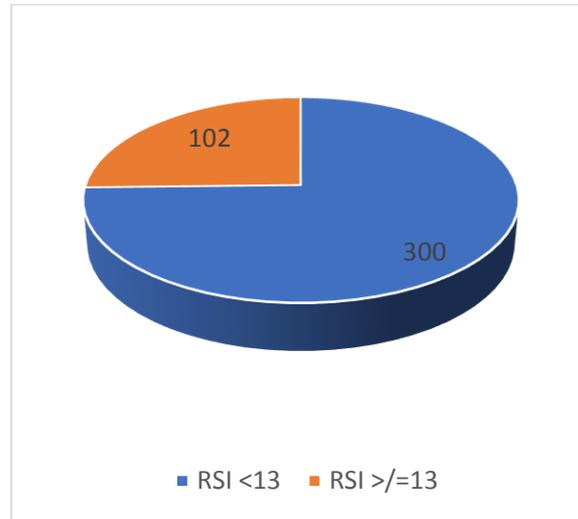
Statistical Analysis: The collected data was entered in MS Excel and statistically analysed.

Continuous data were represented as mean ± standard deviation. Categorical data were represented as number (percent). Incidence rate was calculated.

5. RESULTS:

The clinical data was collected from 402 patients who were COVID confirmed cases out of which 102 patients had $RSI \geq 13$ which is given in figure 1

FIGURE-1 LPR AND NON-LPR GROUP



Demographic Data and symptomatology

Study group

Among the study group male female ratio was 2:1 (n=301:101). The mean age was 46.03 ± 13.91 years. 54.30% of them had other comorbidities such as hypertension, diabetes, coronary artery disease. 102 (25.37%) of them had $RSI \geq 13$ and then named as LPR group which is shown in Table 2

TABLE-2 DEMOGRAPHIC DETAILS OF STUDY GROUP

Parameter (n=402)		Value n (%) / m±sd
Mean age		46.03±13.91
Age range	21-30	91 (22.7%)
	31-40	106 (26.2%)
	41-50	78 (19.6%)
	51-60	93 (23.1%)
	61-70	25 (6.30%)
	71-80	9 (2.1%)
Male: Female		02:01
Reflux Symptom Index score ≥ 13		25.37%
Comorbidities		54.30%

LPR group

Among the LPR group, male female ratio was 1.1:1 (n=54:48). Most commonly affected age group was between 51-60 years. The mean age was 41.24 ± 13.49 years. 42.1% of patients had other comorbidities such as hypertension, diabetes, coronary artery disease

which is given in Table3. The presentation of symptoms of LPR in order of decreasing frequency is shown in figure 2. About 55.8% (n=57) of them had RSI \geq 13 on day 3 of admission.

FIGURE-2 SYMPTOMS OF LPR

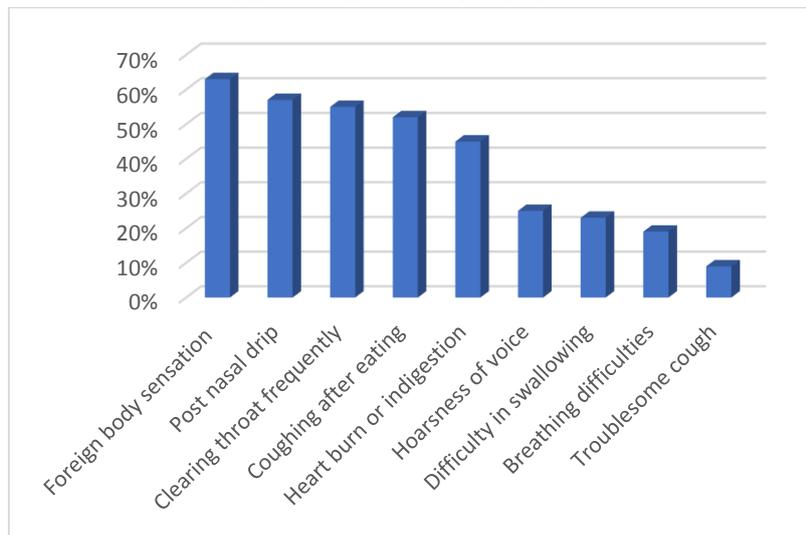


TABLE-3 DEMOGRAPHIC DETAILS OF LPR GROUP

Parameter (n=102)	Value n (%) / m±sd	
Mean age	41.24±13.49	
Age range	21 - 30	17 (16.60%)
	31 - 40	24(23.50%)
	41 - 50	21(20.50%)
	51 - 60	26(25.40%)
	61 - 70	10(9.80%)
	71 - 80	4(3.90%)
Male: Female	1.1:1	
Comorbidities	42.10%	

Treatment given

Of 402 patients 102 patients were started on treatment for LPR with proton pump inhibitors and dietary changes.

6. DISCUSSION:

This was a prospective study done on 402 patients regarding incidence of LPR who are COVID confirmed cases, whereas a study conducted by Chenet al, a retrospective study on clinical characteristics of COVID cases the sample size was 799.^[10] Another study conducted by Jin et al on gastrointestinal symptoms of COVID 19 the sample size was 651, which is also a retrospective study^[11]

Mean age of the study population was 46.03±13.91 and mean age of LPR group in this study was 41.24±13.49 with a age range of 20 to 80 years. The mean age was 58.8 with age

range of 28 to 84 years in study by Jiang et al on impact of LPR on hospitalized COVID patients.^[12]

Sex ratio in study by Wang et al on clinical characteristics of hospitalized patients with COVID 19 was 1.1:1 whereas our study group sex ratio was 2:1 and LPR group sex ratio were 1.1:1 which was similar with the study done by Wang et al.^[13]

The most common symptom in the order of decreasing frequency was foreign body sensation in throat (63%) followed by post nasal drip (57%), clearing throat frequently (55%) and coughing after eating (52%) in this study. A study done by Zhang et al, the common symptoms were fever(91.7%), cough(75%), chest tightness or dyspnoea(36.7%). Gastrointestinal symptoms like nausea, vomiting, belching, abdominal pain was present in 39.6%.^[14]

This study had used reflux symptom index questionnaire as a tool to suspect LPR in the study group, whereas in a study done by Spyridoulis et al both RSI and reflux finding score was used to detect laryngopharyngeal reflux in patients with upper airway symptoms.^[15]

All 402 patients in this study were in category A and were given same treatment but only 102 of them developed LPR. Can be this because of the COVID 19 levels? Different dietary and lifestyle habits would also have been a reason for why the 102 patients developed LPR. But the reason behind as of why the remaining study population (300/402) did not develop LPR is not known.

Treatment given for the LPR group in this study is proton pump inhibitors and dietary changes, which is similar to the study done by Lee et al on changes in quality of life of patients with LPR after treatment^[16]. In a recent short communication, Kow, C.S. and Hasan, S.S.^[17] have suggested trial of melatonin for reducing pro-inflammatory cytokines in COVID19 patients as a treatment for LPR.

Incidence of LPR in hospitalized COVID 19 patients in 3month duration in our study was 25.37%. A study done by Jiang et al on 95 hospitalized patients gives the prevalence rate which was 38.9%^[12]

7. CONCLUSION:

This study helped to assess the hospital-based incidence of LPR in a 3-month duration in COVID19 positive patients. Altered dietary habits, lifestyle habits and altered stress level due to the disease might be a reason for this. Further studies can be done to identify the reason for why the remaining population did not develop LPR.

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