TO STUDY OF STRUCTURAL INVOLVEMENT OF PHUSPHUSA (LUNGS) IN COVID-19 INFECTION WITH SPECIAL REFERENCE TO PRANAVAHA STROTAS

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ABSTRACT

Background: Epidemics like COVID-19 are not new to Ayurveda and the classical textbooks have given a vivid description of such epidemics in the name of 'Janapadodhwamsa'[1] COVID-19 had global impact measuring nearly 780 million cases and more than 7.1 million deaths since December 2019. **Aims and Objectives: T**o study structural involvement of Phyphusa (Lungs) in COVID-19 infection with special reference to Pranavah strotas. **Material and Methods**: Patients were enrolled retrospectively. The data of the patients were collected from case files, laboratory records, and CT scan records. Data analysis was done using SPSS for windows version 23. **Results:** In our study total 102 patients' data was analyzed. In the present study, 70(68.6%) patients were male and 32(31.7%). Bilateral lungs involvement was 82 (80.4%) more frequently observed. And as per CT severity score 49(48%) were in mild category. **Conclusion:** Multiple patchy haziness and ground glass opacity in the CT findings were the most commonly observed which is found to be consistent with typical viral pneumonia as seen in Covid-19.

KEYWORDS: Pranavaha Srotas, COVID-19, Computed Tomography, Lung.

INTRODUCTION

Epidemics like COVID-19 are not new to Ayurveda and the classical textbooks have given a vivid description of such epidemics in the name of 'Janapadodhwamsa'[1] COVID-19 had global impact measuring nearly 780 million cases and more than 7.1 million deaths since December 2019, but the actual number is thought to be higher.[2]

Janapadodhwamsa is the concept of epidemics in Ayurveda. Ritucharya is the season specific regimes where prophylaxis and management of seasonal flu can be seen. Autumn and spring fevers are associated with Pitta and Kapha dominance.[1]

Disorders of Pranavaha Srotas (Pranavaha Srotodushti) manifest as Shwasa (dyspnea), Kasa (cough), and chronic debility, conditions that closely resemble post-COVID respiratory complications. The primary pathological factors in COVID syndrome—chronic inflammation, fibrosis, and immune dysregulation—can be correlated with Vata-Kapha imbalance, Ojas Kshaya (immune depletion), and Ama (toxic accumulation) in Ayurveda. Furthermore, neurological symptoms such as cognitive dysfunction and anxiety may be associated with Vata vitiation affecting the Majja Dhatu (nervous system).[3]

Understanding COVID-19 Pathophysiology is basic prerequisite for deciding Ayurveda preventive and curative strategies. One cannot appropriately bridge Ayurveda with evidence based medicine without understanding epistemology of Ayurveda.[4] Parenchymal involvement of phuphusa (Lung) in COVID-19 is detected by Chest computed tomography (CT). Moreover, chest CT is an established biomarker for the prognosis of the disease and supports clinical decision making.[5] Hence this study was planned with an aim to understand structural involvement of Phyphusa (Lungs).

MATERIAL AND METHODS

Patients were enrolled retrospectively. The study was conducted from October 2021 to June 2023 in the patients fulfilling selection criteria and giving consent. Institutional ethical clearance was obtained before initiating the study.

Inclusion criteria

i.   Positive reverse transcription polymerase chain reaction test for SARS-CoV-2.
ii. Chest computed tomography without intravenous contrast administration.
iii. Patient age ≥18 years.

102 consecutive patients were included from our radiological information system.

Confirmation of COVID-19

Nasopharyngeal and oropharyngeal swab specimens from the upper respiratory tract were obtained from all patients as per the standard microbiological protocol. 2019-nCoV was confirmed by real-time RT-PCR.

Data collection

The data of the patients were collected from case files, laboratory records, and CT scan records.

CT acquisition protocol and image interpretation

Chest CT was performed on an average 3 days (range 1–9 days) after symptom onset that were performed on a 16-Slice Siemens Somatom, Emotion Multidetector CT using 16×0.6 collimation, 100–120 kVp, and 90–130 mAs using low dose institutional protocol.

Sharp kernel (B70s) algorithm was used. Mediastinal window settings and lung window settings were viewed. CT suite was decontaminated using surface disinfection with 70% ethanol or 0.1% sodium hypochlorite. Passive air exchange was performed for 60 min after each CT examination.

An experienced radiologist evaluated CT images on Apple workstation in a satellite room. Assessment of presence, location, extent, and density of lung parenchymal abnormality was made and specifications as per unilaterality/bilaterality, lobar distribution and with regards to anterior and posterior location was noted. Ground glass opacity (GGO) was defined as increase in density of lung with visualization of bronchial and vascular structures through it, whereas consolidation was defined as increased density of lung tissue through which vascular and bronchial structures were not visible. Vascular enlargement was considered to be present when vessel diameter was more than 3 mm.

CT chest severity score was obtained and patients were categorized based on the severity into mild (<8), moderate (from 9 to <15), and severe (≥15).

Statistical Analysis

Data was entered in a Microsoft Excel spreadsheet. Continuous variables were summarized as median and range. Data analysis was done using SPSS for windows version 23 (IBM

Corp. Released 2012. IBM SPSS Statistics for Windows, Version 23.0. Armonk, NY: IBM Corp.).[6]

RESULTS

In our study total 102 patients' data was analyzed. In the present study, 70(68.6%) patients were male and 32(31.7%). Male to female ratio was 1:0.45. Overall mean age was 53.9 (±15.4) years. Most common complaint with which patient presented was cough 46(45.1%) followed by fever 34(33.3%) and dyspnea 22(21.6%).

Bilateral lungs involvement was far more common 82 (80.4%). On Computed tomography, multiple patchy areas of consolidation 40(39.2%) was the most consistent finding. Ground glass haziness appearance 68(66.7%) followed by segmental collapse 30(29.4%) was the most prominent finding. Whereas, pleural effusion was present in 12(11.7%) and 1(0.98%) had pericardial effusion.

Patients were categorized based on the severity into mild (<8), moderate (from 9 to <15), and severe (≥15) on the basis of CT findings. Out of 102 cases, most 49(48%) of them were having mild score followed by moderate score 41(40.2%) and 12 (11.8%) had severe CT severity score.
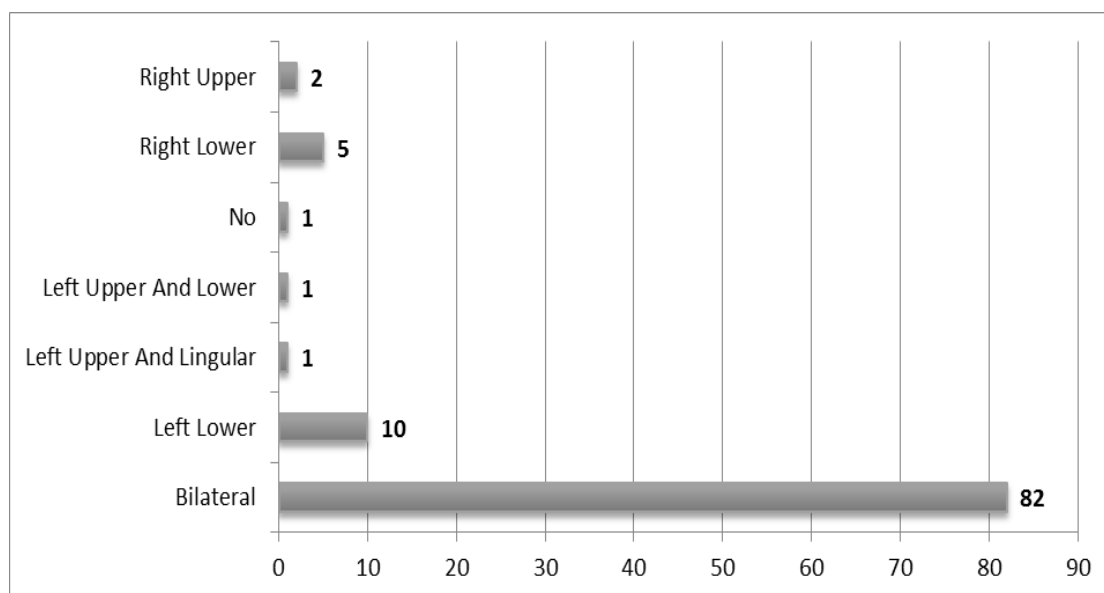

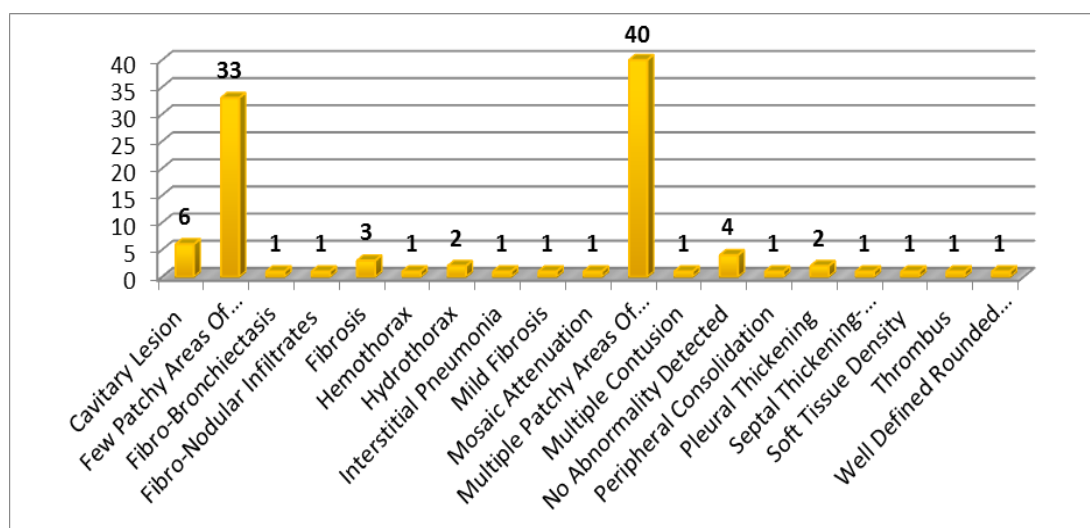**Fig 1: Side and Site Involvement.**

Fig. 2: Computed Tomography findings.

Table 1: Presence of Effusion.

Effusion	Frequency	Percentage (%)
Absent	87	87.2
Pericardial	1	0.98
Pleural	12	11.7
Total	102	100

Table 2: Distribution as per CT severity Score.

CT severity Score	Frequency	Percentage (%)
Mild (<8)	49	48
Moderate (9-15)	41	40.2
Severe (>15)	12	11.8
Total	102	100

DISCUSSION

In the present study 102 patients' data was collected. Overall mean age was 53.9 (±15.4) years. Mean age amongst female patient was 53.5(± 14.2) and mean age amongst male patient was 54.07(±16.06). Whereas range was 19-98 years. Shahnawaz et al in his study amongst Kashmiri population observed the mean age of patients in the study was 37 ± 19.7 years with a range of 2–70 years.[7]

In our study total 102 patients' data was analyzed out of which 32(31.7%) were female and 70 were male patients. Male to female ratio was 1:0.45. Shahnawaz et al observed that males were more as compared to females (59.4% vs. 40.6%).[7] Males are known to get infected more by coronaviruses as compared to females as reported by Badawi A. et al.[8] and Channappanavar R. et al. in their studies on MERS-Cov and SARS- CoV related infections.[9]

Most common complaint with which patient presented was cough 46(45.1%) followed by fever 34(33.3%) and dyspnea 22(21.6%). Shahnawaz et al noted Cough and fever as the most common symptoms in 21.8% and 20.3% of patients, respectively.[7] In a study from Wuhan by Chaolin Huang et al., fever and cough were the most common symptom in 98% and 76%, respectively.[10] In a study by Pavan K Bhatraju et al. from Seattle region in America reported cough and fever as the most common feature followed by less common systemic features.[11] Although the symptoms of COVID-19 have been same in different publications around the world, but severity and frequency do vary.

Bilateral lungs involvement was 82 (80.4%) more frequently observed. Bilateral pattern of involvement in COVID-19 patients on CT chest has been reported by various authors. Heshui Shi et al. reported that 64 (79%) among 81 patients had bilateral disease.[12] Damiano Caruso et al. also reported bilateral distribution of lesions in nearly 91% (n = 58).[13]

In the present study we observed ground glass haziness appearance 68(66.7%) followed by segmental collapse 30(29.4%) in Computed Tomography studies. (Table 7) Shahnawaz et al observed ground glass opacity as the most common finding closely followed by consolidation.[7] In a study by Damiano Caruso et al. Ground glass opacity was present in 89%.[13]

Out of which most 49(48%) were in the mild score followed by moderate score in 41(40.2%) and 12 (11.8%) were having severe CT severity score.

CONCLUSION

In the present study we observed that males are more commonly involved compared to females. Multiple patchy haziness and ground glass opacity in the CT findings were the most commonly observed which is found to be consistent with typical viral pneumonia as seen in Covid-19. We also observed that pleural effusion was also associated in nearly 10 % of the cases which is known to be having bad prognostic value.

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