

Association between COVID-19 infection and mediastinal lymphadenopathy: A systematic review and meta-analysis

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COVID-19 is a progressive viral disease that caused a significant morbidity and mortality worldwide. Typically, patients with COVID-19 infection present with clinical manifestations such as dyspnea, cough, fatigue, respiratory failure, and mediastinal lymphadenopathy. An increase in the size of mediastinal lymph nodes, called mediastinal lymphadenopathy is a common finding in COVID-infected individuals. In the present study, we aimed to review whether mediastinal lymphadenopathy is a typical or atypical feature in individuals suffering from COVID-19 infection. PubMed database was reviewed and a total of 25 articles with 4305 patients were included in the analysis. Bayesian hierarchical models were used to estimate the pooled proportion and risk difference. The incidence of mediastinal lymphadenopathy was found to be 12.62%. Furthermore, the mortality rate was found to be significantly higher in patients with mediastinal lymphadenopathy compared to those without mediastinal lymphadenopathy (35.3% vs. 9.4%; $P < 0.001$), suggesting severity of the condition. Furthermore, the risk difference for mortality and the overall effect were found to be significant ($Z = 3.33$; $P = 0.0009$). Conclusively, data suggest that mediastinal lymphadenopathy is associated with increased mortality in COVID-19 patients; however, it is an atypical feature of COVID-19 due to its lower incidence rate.

Keywords: Chest tomography, Corona virus, ICU admission, Mortality, Incidence rate

Introduction

Human coronaviruses (CoV) such as severe acute respiratory syndrome (SARS)-CoV, Middle East respiratory syndrome (MERS)-CoV, and SARS-CoV-2 induce severe respiratory tract infections and respiratory distress syndrome, resulting in increased mortality rate^{1,2}. The first case of coronavirus 2 was diagnosed at a wet animal wholesale market in Wuhan, Hubei Province, China in December 2019³. In early 2020, World Health Organization (WHO) designated coronavirus 2 as COVID-19 and declared it a pandemic. As per WHO data of January 2024, there are 774 million confirmed COVID-19 cases⁴. It is predominantly transmitted through nasal or mouth droplets and close contact. The incubation period of COVID-19 is around five days. The reported symptoms are mild to high-grade fever, dry cough, muscular pain, sore throat, headache, cough with sputum, and chest discomfort⁵. Progressive pneumonia develops 1–2 weeks after the onset of

symptoms, and 10% of these patients require intensive care unit (ICU)⁶.

Early diagnosis and subsequent management of COVID-19 have been proposed as progressive steps to decrease the mortality rate. The Centers for Disease Control and Prevention (CDC) reported the presence of co-anomaly such as cardiovascular (60.9%), type II Diabetes Mellitus (39.5%), renal disease (20.8%), and chronic lung disease (19.2%) in 76.4% of decedents⁷. To date, reverse transcription-polymerase chain reaction (RT-PCR) has been considered the gold standard for the detection and diagnosis of SARS-CoV-2 infection⁸. Further, imaging modalities such as chest X-ray (CXR), ultrasound, computerized tomography (CT) scan, and single-photon emission computed tomography (SPECT) and positron emission tomography (PET) scan play an important and critical role in the diagnosis of COVID-19-related pulmonary manifestations⁹. Studies in the literature showed that CT has better sensitivity and specificity than RT-PCR as CT scans may reveal lung abnormalities in COVID-19 subjects with negative RT-PCR findings¹⁰.

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As a common CT feature in COVID-19 cases, mediastinal lymphadenopathy is characterized as the enlargement of mediastinal lymph nodes with a short axis more than 10 mm in length¹¹. The incidence of mediastinal lymphadenopathy was 6% in COVID-19 cases which has risen to 66% in severe cases^{11,12}. Mediastinal lymphadenopathy is also associated with sarcoidosis, lymphoma, heart failure, coccidioidomycosis, and tuberculosis^{11,13}.

Based on this background, the present study was proposed to assess whether mediastinal lymphadenopathy could be considered a typical or not atypical feature associated with COVID-19.

Materials and Methods

Search strategies

The literature on mediastinal lymph node enlargement in individuals with COVID-19 infection

was reviewed on the PubMed database and summarized the findings followed by systematic analysis. The database was searched manually for the inclusion of the eligible studies (Fig. 1). The following search terms were used, "mediastinal lymphadenopathy" or "mediastinal lymph node" or "lymphadenopathy" with the phrase "COVID" or "coronavirus".

Inclusion and exclusion criteria

Published studies including cohort, case-control, retrospective, and observational with the reported occurrence of mediastinal lymphadenopathy in COVID-19 patients were included in the analysis. Moreover, the studies in the English language only were included. The excluded studies were duplicate studies with the same population, studies with no cases of mediastinal lymphadenopathy, overlapping studies, and case reports.

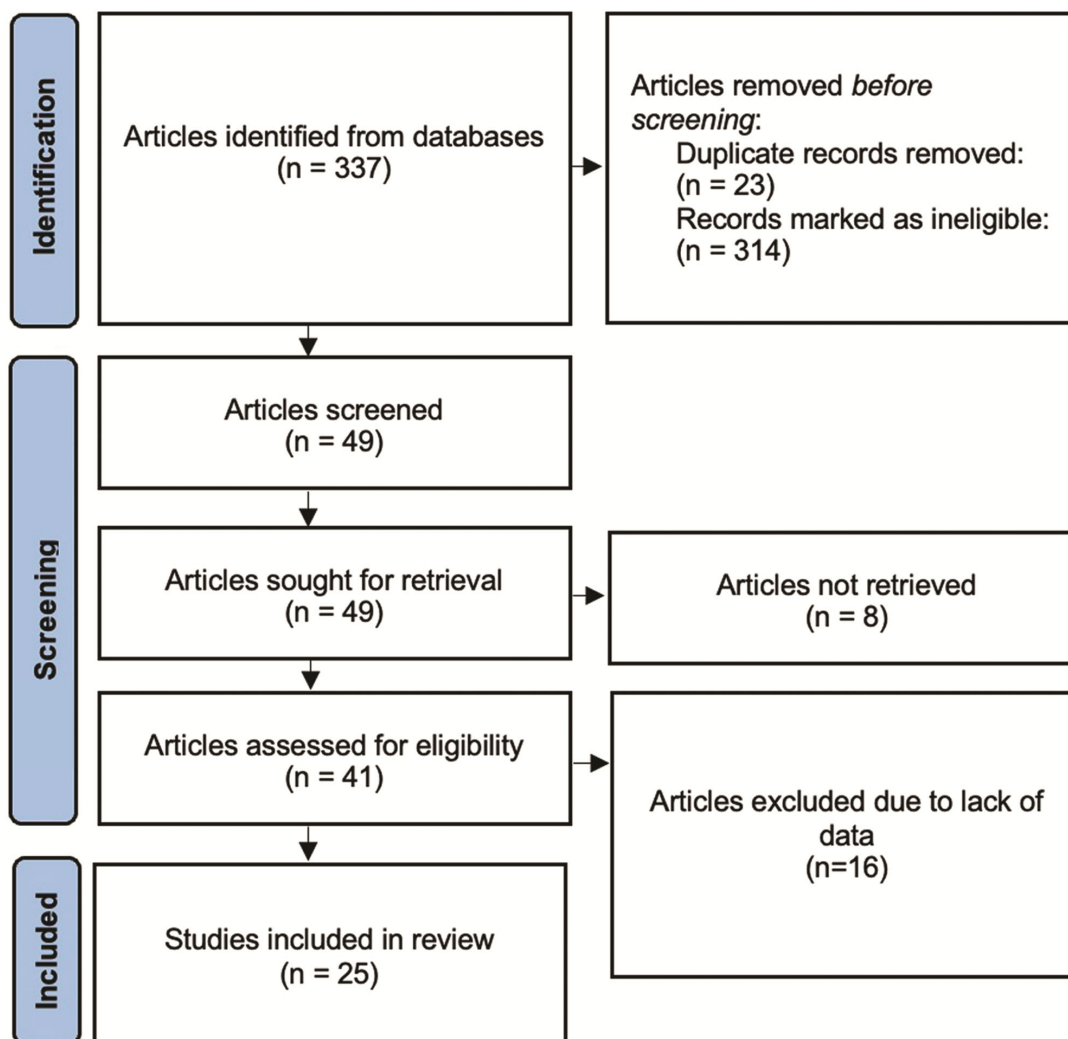


Fig. 1 — Flow chart of the study.

Data extraction

Two independent researchers searched, screened, and cross-checked the studies. The extracted data included publication date of the article, country, study design, sample size, number of patients with reported mediastinal lymphadenopathy, age, ICU required, mortality, and other features.

Statistical analysis

The statistical analysis was performed using RevMan v. 5 software. Heterogeneity tests were performed to estimate the level of inconsistency (I^2) across the selected publications¹⁴. In the absence of statistical heterogeneity, a fixed-effects model was used. Conversely, a random-effects model was used to identify heterogeneity. The Bayesian hierarchical models were used to estimate the pooled proportion and the results were depicted using forest plots.

Furthermore, the publication bias was assessed using Egger's and Begg's tests¹⁵.

Results

Search history

By PubMed searching, 337 articles were retrieved including 41 pertinent articles. After close analysis by two independent researchers, 25 articles with a total of 4305 patients were included in the analysis. Among them, 4087 patients suffered from COVID-19 (age range 17-98 years) comprising 2305 males and 1695 females (gender data from 23 studies). The incidence of mediastinal lymphadenopathy was found to be 12.62% (516 patients; 25 studies) (Table 1).

Clinical symptoms and co-morbidities

The most common symptoms were cough (1692 of 2671 patients, 63.3%; 16 studies), fever (1648 of 2536

Table 1 —Study details and patient's characteristics

Study	Study type	Study conducted at	Year of study	Sample size (n)	Incidence of COVID-19, n (%)	Age, years Range/ Mean \pm SD/ Median	Gender M/F (n/n)	Incidence of ML, n (%)
Sardanelli <i>et al.</i> ¹⁶	Retrospective study	Italy	2020	410	410 (100)	68	288/122	76 (19)
Shi <i>et al.</i> ¹⁷	Retrospective study	China	2020	81	81 (100)	45.5	42/39	10 (12.3)
Li <i>et al.</i> ¹⁸	-	China	2020	83	83 (100)	49.5	44/39	7 (8.4)
Darwish <i>et al.</i> ¹⁹	Retrospective study	Saudi Arabia	2021	95	95 (100)	18-84	40/55	13 (13.6)
Qin <i>et al.</i> ²⁰	Retrospective study	China	2020	168	88 (52.4)	47.3 \pm 12.4	42/46	2 (2.3)
Grassi <i>et al.</i> ²¹	Retrospective study	Italy	2020	134	126 (94)	29-93	89/37	69 (54.8)
Eftekhari	Retrospective study	Iran	2021	120	120 (100)	22-83	65/55	2 (1.7)
Moghadam <i>et al.</i> ²²	-	-	-	-	-	55.9 \pm 15.82	-	-
Silva <i>et al.</i> ²³	Retrospective study	Italy	2021	280	256 (91.4)	32-98	158/98	15 (5.9)
Pakdemirli <i>et al.</i> ²⁴	Retrospective study	UK	2020	18	18 (100)	20-89	9/9	3 (16.7)
Çinkooğlu <i>et al.</i> ²⁵	Retrospective study	Turkey	2020	185	147 (100)	19-85	70/77	18 (12.2)
						48.7		
Pilechian <i>et al.</i> ²⁶	Case control study	Iran	2021	195	195 (100)	60	118/77	35 (17.94)
Kaur <i>et al.</i> ²⁷	Retrospective study	India	2021	152	152 (100)	51-60	115/37	5 (3.3)
Valette <i>et al.</i> ²⁸	-	France	2020	15	9 (60)	-	-	6 (66)
Zhao <i>et al.</i> ²⁹	Retrospective study	China	2020	80	80 (100)	17-72	43/37	1 (1.3)
Satici <i>et al.</i> ³⁰	Cross-sectional study	Turkey	2021	650	650 (100)	56.9 \pm 14.9	333/317	60 (9.2)
Schiaffino <i>et al.</i> ³¹	-	Italy	2021	552	552 (100)	65	364/188	87 (16)
Meng <i>et al.</i> ³²	Cohort study	China	2020	270	270 (100)	18-65	102/168	4 (1.9)
						51.9 \pm 15.6		
Gündüz <i>et al.</i> ³³	Retrospective study	Turkey	2021	117	117 (100)	73 \pm 18	71/46	14 (11.9)
Du <i>et al.</i> ³⁴	Retrospective study	China	2020	125	125 (100)	16-67	63/62	45 (36)
Luo <i>et al.</i> ³⁵	Retrospective study	China	2020	140	78 (55.7)	19-79	82/58	2 (2.8)
Song <i>et al.</i> ³⁶	Retrospective study	China	2020	51	51 (100)	49 \pm 16	25/26	3 (6)
Abrishami <i>et al.</i> ³⁷	Retrospective study	Iran	2020	43	43 (100)	27-87	28/15	3 (7)
						60.7 \pm 14.4		
Khosravi <i>et al.</i> ³⁸	Retrospective study	Iran	2021	121	121 (100)	61	67/54	6 (5)
Meiler <i>et al.</i> ³⁹	Retrospective study	Germany	2020	64	64 (100)	21-88	40/24	18 (28)
Mruk <i>et al.</i> ⁴⁰	Retrospective study	Poland	2021	156	156 (100)	28-92	89/67	12 (7.7)

[M/F=Male/Female, ML=Mediastinal lymphadenopathy, SD=Standard deviation, n=number of patients, %=percentage]

patients, 65%; 16 studies), shortness of breath (993 of 2335 patients, 40%; 14 studies), and body fatigue (476 of 1608 patients, 29.6%; 11 studies). Other symptoms included headache (129 of 1390 patients, 9.4%; 7 studies), sore throat (130 of 536 patients, 24.3%; 6 studies), vomiting (47 of 4421 patients, 10.6%; 5 studies), and diarrhea (140 of 1347 patients, 10.4%; 8 studies) (Table 2). At the time of screening, patients had co-morbidities such as hypertension (492 of 1459 patients, 33.7%; 8 studies), diabetes (368 of 1755 patients, 21%; 8 studies), cardiovascular (460 of 2132 patients, 21.6%; 10 studies), renal (88 of 1005 patients, 8.8%; 4 studies), and respiratory disorders (107 of 1459 patients, 7.3%; 8 studies). Furthermore, the C-reactive protein was found to be elevated in 517 patients. The regulation in other laboratory parameters such as lymphocyte, leukocyte, and the neutrophil count is shown in Table 2.

CT findings

The details of initial CT imaging findings of COVID-19 patients from the selected studies are recorded in Table 3. Lesions were found in a total of 663 patients and are distributed in lobular, subpleural, and diffuse regions. 2290 (88.1%) patients had bilateral lung involvement while 145/1163 (12.5%) had unilateral lung involvement only. Further, pure Ground-glass opacity (GGO) (2050 of 3115 patients, 73.5%; 20 studies), consolidation (917 of 2819

patients, 32.5%; 17 studies), mixed (836 of 1961 patients, 42.6%; 14 studies), and crazy wavy patterns (615 of 2277 patients, 27%; 13 studies) were the main findings. Pleural effusion and vascular thickening were found in 206 and 125 patients, respectively.

ICU admission and mortality in patients with mediastinal lymphadenopathy

In total, 316 of 1543 patients (20.5%; 6 studies) were admitted to ICU. Few studies provided data on the patients with mediastinal lymphadenopathy who were admitted to ICU. When the data of patients with and without mediastinal lymphadenopathy was compared, a significant increase in the percentage of patients with mediastinal lymphadenopathy requiring ICU admission was observed (35% vs 20.4%). Further, heterogeneity tests revealed I^2 index of 93% ($Tau^2 = 2.62$; $Chi^2 = 27.16$; $df = 2$; $P < 0.0001$) in these patients. However, the overall effect was found to be non-significant ($Z = 0.76$; $P = 0.45$). The forest plot is shown in Fig 2). Next, the publication biasness using Egger’s test (intercept = 1.32, $P = 0.71$) and Begg’s test (Kendall’s Tau = 0.069, $P = 0.97$) were found to be non-significant.

Overall mortality in patients with COVID-19 was estimated to be 19.6% (402 of 2053 patients; 8 studies). Further, the mortality rate was 35.3% in patients with mediastinal lymphadenopathy while 9.4% in patients without mediastinal

Table 2 — Co-morbidities and laboratory findings of the patients

Study n (%)	Hypertension	Diabetes	Cardiovascular disease	Renal disorders	Respiratory disorders	Increased/ Decreased leukocyte count, n/n	Increased/ Decreased neutrophil count, n/n	Increased/ Decreased lymphocyte count, n/n	Elevated C-reactive protein
Shi <i>et al.</i> ¹⁷	-	-	-	-	-	-	-	-	48 (59.2)
Li <i>et al.</i> ¹⁸	5 (6)	7 (7.8)	1 (1.2)	-	5 (6)	9/10	17/5	-/44	50 (60.2)
Darwish <i>et al.</i> ¹⁹	-	-	-	-	-	1/23	3/17	2/28	84 (88.4)
Qin <i>et al.</i> ²⁰	-	-	-	-	-	-	-	-	32 (36.4)
Eftekhari	-	-	-	-	-	-	-	-	120 (100)
Moghadam <i>et al.</i> ²²	-	-	-	-	-	-	-	-	-
Silva <i>et al.</i> ²³	104 (40.6)	-	27 (10.5)	-	21 (8.2)	-	-	-	-
Pakdemirli <i>et al.</i> ²⁴	-	-	-	-	-	-	-	-	17 (100)
Pilechian <i>et al.</i> ²⁶	67 (34.4)	58 (29.7)	50 (25.6)	13 (6.7)	11 (5.6)	-/3	-	-/10	19 (9.74)
Zhao <i>et al.</i> ²⁹	-	-	-	-	-	1/41	1/55	-	33 (41.3)
Satici <i>et al.</i> ³⁰	226 (34.8)	164 (25.2)	57 (8.8)	24 (3.7)	24 (3.7)	-	-	-	-
Schiaffino <i>et al.</i> ³¹	-	98 (18)	271 (49)	-	-	-	-	-	-
Gündüz <i>et al.</i> ³³	44 (37.6)	14 (11.9)	19 (16.2)	8 (6.8)	39 (33.3)	-	-	-	-
Luo <i>et al.</i> ³⁵	-	-	-	-	-	5/36	-	-/56	-
Song <i>et al.</i> ³⁶	5 (10)	3 (6)	1 (2)	-	1 (2)	-	-	-	-
Abrishami <i>et al.</i> ³⁷	18 (41.9)	16 (37.2)	14 (32.6)	43 (100)	1 (2.3)	-	-	-	-
Khosravi <i>et al.</i> ³⁸	-	-	11 (9.1)	-	-	4/7	4/-	23/-	114 (94.2)
Meiler <i>et al.</i> ³⁹	23 (37)	8 (12)	9 (14)	-	5 (8)	-	-	-	-

Table 3 — CT findings of the recruited patients

Study n (%)	Multiple lesions	Unilateral/ Bilateral lung involved	GGO	Consolidation	GGO + Consolidation	Crazy paving pattern	Halo sign/ Reversed halo sign	Pleural effusion	Lobular/ Subpleural/Diffuse
Shi <i>et al.</i> ¹⁷	-	9/64	53 (65)	-	9 (11.1)	8 (10)	-	-	-/36/-
Li <i>et al.</i> ¹⁸	-	-/79	81 (97.6)	53 (63.9)	-	30 (36.1)	-	7 (8.4)	-
Darwish <i>et al.</i> ¹⁹	55 (57.9)	15/80	48 (49.4)	-	48 (50.5)	-	29/15	12 (12.6)	70/66/31
Qin <i>et al.</i> ²⁰	-	-	-	-	-	59 (67)	-	4 (4.5)	-
Grassi <i>et al.</i> ²¹	-	13/109	33 (26.2)	4 (3.2)	89(70.6)	95 (75.4)	-/30	18 (14.3)	81/8/24
Eftekhari Moghadam <i>et al.</i> ²²	94 (78.3)	-	119 (99.2)	-	110 (92.4)	-	-	-	-
Silva <i>et al.</i> ²³	-	-/245	159 (62.1)	4 (1.6)	52 (20.3)	-	-	15 (5.9)	-/-/37
Pakdemirli <i>et al.</i> ²⁴	11 (61)	0/18	8 (44)	7 (39)	3 (17)	4 (22)	7/-	7 (39)	18/-/-
Çinkooğlu <i>et al.</i> ²⁵	129 (89.1)	20/127	121 (82.3)	22 (15)	48 (32.7)	32 (21.8)	15/22	3 (2)	95/41/54
Kaur <i>et al.</i> ²⁷	-	15/121	50 (32.9)	28 (18.4)	23 (15.1)	13 (8.6)	3/12	5 (3.3)	-/106/29
Zhao <i>et al.</i> ²⁹	80 (100)	4/76	56 (71)	22 (27.8)	-	-	-	1 (1.3)	-/72/-
Satici <i>et al.</i> ³⁰	-	-/591	628 (96.6)	317 (48.8)	-	74 (11.4)	-/59	16 (2.5)	-
Schiaffino <i>et al.</i> ³¹	-	-/467	172 (31.2)	13 (2)	315 (57.1)	200 (36.2)	-	39 (7)	-
Meng <i>et al.</i> ³²	166 (61.5)	-	-	-	-	-	-	-	-/75/-
Gündüz <i>et al.</i> ³³	-	-	96 (82)	70 (59.8)	46 (39.3)	5 (4.2)	2/3	11 (117)	-/-/58
Du <i>et al.</i> ³⁴	105 (84)	35/70	99 (79.2)	18 (14.4)	-	-	-	0 (0)	-/33/-
Luo <i>et al.</i> ³⁵	23 (32.9)	11/59	27 (38.6)	2 (2.8)	41 (58.6)	-	-	4 (5.7)	-
Song <i>et al.</i> ³⁶	-	7/44	39 (77)	28 (55)	30 (59)	-	-	4 (8)	-
Abrishami <i>et al.</i> ³⁷	-	3/40	15 (34.9)	4 (9.3)	4 (9.3)	7 (16.3)	-	9 (20.9)	-/-/6
Khosravi <i>et al.</i> ³⁸	-	8/113	110 (90.9)	96 (79.3)	-	-	-	26 (21.7)	4/66/51
Meiler <i>et al.</i> ³⁹	-	5/57	62 (97)	49 (77)	-	16 (25)	-	13 (20)	-/-/25
Mruk <i>et al.</i> ⁴⁰	-	-	103 (66)	99 (63.5)	-	72 (46.2)	6/-	12 (7.7)	-

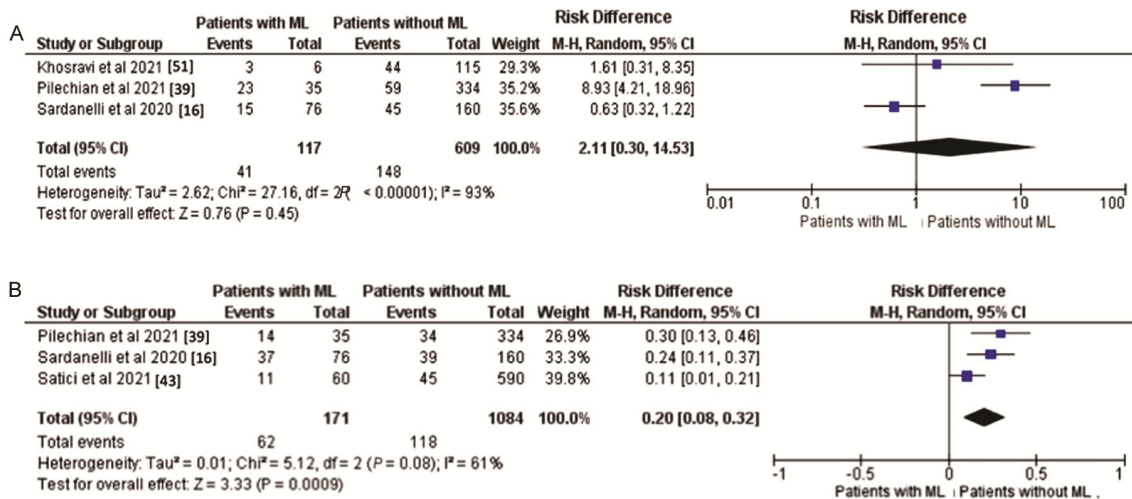


Fig. 2 — Forest plot of (A) ICU admission and (B) mortality in patients with and without mediastinal lymphadenopathy.

lymphadenopathy. The risk difference was found to be significant, suggesting severe conditions in the patients with mediastinal lymphadenopathy ($P < 0.001$). The data is shown in Table 4.

Heterogeneity tests revealed I^2 index of 61% ($Tau^2 = 0.01$; $Chi^2 = 5.12$; $df = 2$; $P = 0.08$) in these patients. Furthermore, the risk difference for mortality was calculated and the overall effect was found to be

Table 4 — Hospitalization status of patients

Study [n (%)]	Ventilation	ICU patients	ICU patients with ML	ICU patients without ML	Overall mortality	Mortality in COVID-19 patients without ML	Mortality in patients with ML
Sardanelli <i>et al.</i> ¹⁶	-	60 (15)	15 (19.7)	45 (13.5)	136 (33.2)	39 (11.7)	37 (48.7)
Silva <i>et al.</i> ²³	-	20 (7.8)	-	-	-	-	-
Pakdemirli <i>et al.</i> ²⁴	-	-	-	-	5 (27.8)	-	-
Pilechian <i>et al.</i> ²⁶	33 (16.92)	82 (42.1)	23 (65.7)	59 (36.9)	48 (24.61)	34 (21.25)	14 (40)
Valette <i>et al.</i> ²⁸	9 (60)	15 (100)	-	-	-	-	-
Satici <i>et al.</i> ³⁰	-	-	-	-	56 (8.6)	45 (7.62)	11 (18.3)
Schiaffino <i>et al.</i> ³¹	-	92 (17)	-	-	107 (19)	-	-
Luo <i>et al.</i> ³⁵	-	-	-	-	4 (5.1)	-	-
Abrishami <i>et al.</i> ³⁷	-	-	-	-	5 (11.6)	-	-
Khosravi <i>et al.</i> ³⁸	-	47 (38.8)	3 (6.4)	44 (38.3)	36 (29.7)	-	-
Meiler <i>et al.</i> ³⁹	-	-	-	-	9 (14)	-	-

[ICU=Intensive Care Unit, ML=Mediastinal lymphadenopathy, n=number of patients, %=percentage]

significant, suggesting mediastinal lymphadenopathy is associated with increased mortality in COVID-19 patients ($Z = 3.33$; $P = 0.0009$). The forest plot is shown in Fig 2B.

Discussion

Till date, several types of human coronaviruses such as CoV 229E, CoV NL63, CoV OC43, and CoV HKU1 have been known as endemics throughout the world while COVID-19 is considered as a pandemic with a high mortality rate¹. It has also been associated with development of mediastinal lymphadenopathy in the infected patients. Our analysis revealed the estimated incidence of mediastinal lymphadenopathy in COVID-19 patients as 12.62%. However, reports in the literature suggest the incidence range of 1 to 6 percent⁴. Hence, the enlargement of mediastinal lymph nodes may or may not be considered the typical characteristic of COVID-19.

COVID-19 infection is usually accompanied by modest symptoms, if not asymptomatic⁷. In our analysis, the typical symptoms in the symptomatic patients included fever (65%), dry cough (63.3%), muscular pain (29.6%), and dyspnea (40%). Further, hypertension (33.7%), diabetes (21%), and ischemic heart disease (21.6%) as the major comorbidities presented in patients suffering from COVID-19. Evidence in the literature reported that a “cytokine storm” seems to occur in certain individuals with severe COVID-19 infection^{41,42}. In the present analysis, C-reactive protein was elevated in 58.7% of patients along with a significant decrease in lymphocyte, neutrophil, and leukocyte counts.

Furthermore, Chest CT is found to be more sensitive than conventional radiographic techniques in

identifying lung abnormalities such as ground-glass opacities, consolidations, or other lesions that may not appear clearly on an X-ray⁴³. For instance, CT chest often reveals the involvement of bilateral lung with multi-lobar GGO majority in posterior distribution, particularly in the lower lobes and rarely in the right middle lobe⁴⁴. At later stages, CT findings showed consolidation, linear opacities, bilateral and peripheral disease, crazy paving pattern, and reserved halo sign, all of which indicate greater total lung involvement and are associated with longer infection duration. Corroboratively, CT scan is considered the best imaging modality for the diagnosis of mediastinal lymphadenopathy⁴⁵.

Further, it has been observed that COVID-19 patients with lymphadenopathy were more serious and admitted to ICU as compared to COVID-19 patients without mediastinal lymphadenopathy. However, the overall effect of lymphadenopathy on ICU admission was found to be non-significant ($P>0.05$). COVID-19 is associated with a high mortality rate. An association with lymphadenopathy further increases the mortality in affected patients. In the analysis, the overall effect of lymphadenopathy on the mortality rate was found to be significant, suggesting that lymphadenopathy is associated with a high mortality rate in patients with COVID-19 ($P<0.05$).

Substantial reports in the literature suggest that mediastinal lymphadenopathy is a post effect of COVID-19 vaccination^{46,47}. Since December 2020, a variety of vaccines based on mRNA, vector, and protein subunit methods against COVID-19, have been introduced into the market. Several countries around the world have begun mass immunization

programs. The Food and Drug Administration (FDA) of the United States approved Pfizer-BioNTech and Moderna⁴⁸. Although vaccinations have many advantages and are very efficient in many situations. Only minor and insignificant adverse effects have been reported till now⁴⁹. However, several serious side effects were discovered during physical examinations, including lymphadenopathy, which was seen in 0.3 percent and 1.1 percent of the Pfizer-BioNTech and Moderna vaccines⁵⁰. Ample number of reports has been published in the literature that associates mediastinal lymphadenopathy with post-COVID-19 vaccination⁵¹⁻⁵⁵.

This study has several limitations: firstly, data specifically on mediastinal lymphadenopathy is very limited. Out of 25 articles, only 3 articles provided data on ICU admission and mortality. Secondly, CT data was not available especially for the patients affected with mediastinal lymphadenopathy.

Conclusion

Mediastinal lymphadenopathy has been reported rarely in the early cases of COVID-19. However, it is found more common in critically ill individuals. During COVID-19 pandemic, it was difficult to assess the entire clinical state of patients to aid in the diagnosis and treatment. After a comprehensive analysis, we observed that the incidence rate of mediastinal lymphadenopathy in COVID-19 patients is low however, mortality rate is high. It may infer that mediastinal lymphadenopathy is a predictor but atypical feature of COVID-19. Further research is needed to investigate the host response to viral infection and to inform the management of COVID-19 patients with mediastinal lymphadenopathy.

Conflict of interest

The authors declare no competing interests.

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