

Case control study: Factors associated with COVID-19

Instituto de Infectologia Emílio Ribas - IIER, Sao Paulo, Brazil, 2021-2022.

Ana Freitas Ribeiro^{1,2}, Roberta Figueiredo Cavalin^{1,2}, Alina Bernardes Habert¹, Ana Paula A. dos Santos¹, Ana Paula R. Veiga¹, Fatima Takako Yamada¹, Giap Passos F. P. Gomes¹, Giulia Soler Bianchi¹, Karen Cristina R. Madra¹, Luana Vasconcelos Freitas¹, Lucas Campos de Lima¹, Marcia Aparecida dos S. Gouveia¹, Marco Aurelio Souza¹, Marilia Francesconi Felicio¹, Marta de Oliveira Ramalho¹, Meire Bócoli Rossi¹, Murilo de Oliveira¹, Sandra Tardochi Melo¹, Wilma Augusta Fernandes¹.

Affiliation 1: Instituto de Infectologia Emílio Ribas - Secretaria de Estado da Saúde de São Paulo - 2: Universidade Municipal de São Caetano do Sul – Campus São Paulo - Prefeitura de São Caetano do Sul

- ✓ Multiple logistic regression analysis showed a significant association for the following variables:
Age group : 30 to 39 years (OR_{adj} 3.37 95% CI 1.36-8.34) - 40 to 49 years (OR_{adj} 2.79 95% CI 1.13-6.90)
50 to 59 years (OR_{adj} 5.03 95% CI 2.37-14.40) - ≥ 60 years (OR_{adj} 5.84 95% CI 2.37-14.41);
SARS (OR_{adj} 1.63 95% CI 1.03-2.58) - HIV (OR_{adj} 0.56 95% CI 0.36-0.82)
Vaccination: 1 or 2 doses presented (OR_{adj} 0.66 95% CI 0.30-1.46) - 3 or 4 doses (OR_{adj} 0.73 95% CI 0.33-1.61).



BACKGROUND

The COVID-29 pandemic had an impact on morbidity and mortality, Brazil presented 38,806,622 confirmed cases and 712,205 deaths and the state of São Paulo 6,858,844 and 183,428 deaths, data 05/29/2024. The Emílio Ribas Infectious Institute of Infectious Diseases is a public hospital specializing in infectious diseases, with 120 beds. It serves patients through the Unified Health System - SUS, being a reference for infectious diseases in the state of São Paulo. From 2020 to 2024, 18,810 suspected cases of COVID-19 were reported at IIER, of which 39.8% were confirmed.

METHODS

A case-control study was developed, where the cases are patients with Influenza Like Illness-ILI or severe acute respiratory syndrome-SARS, with laboratory confirmation of SARS-COV-2 by RT-PCR or antigen. Controls are patients with ILI or SARS with negative laboratory tests. Patients were interviewed, collecting demographic, clinical data and vaccination history.

RESULTS

- 522 suspected cases of COVID-19 were analyzed, of which 260 (59.8%) were cases and 262 (50.2%) controls.
- The median age among cases was 55 years IQR (40-66) and in controls 44 years IQR (32-56.25), $p < 0.001$.
- 332 (63.6%) were classified as ILI and 190 (36.4%) as SARS, with 45% of SARS in cases and 27.9% in controls, $p < 0.001$.
- 53.1 were male and 46.9% female, $p = 0.383$.
- There was a predominance of white (55.6%), followed by browns (27.5%) and blacks (14.2%), $p = 0.640$.
- 68.0 of the patients had at least one comorbidity, $p = 0.331$.
- The main diseases were HIV (34.1%), hypertension (20.7%) and diabetes mellitus-DM (12.6%).
- Hypertension and DM predominated among the cases, $p = 0.02$ and 0.03 , respectively. HIV predominated among controls (40.1%), $p = 0.004$.
- Previous vaccination history against COVID-19 was 93.9% in controls and 92.2 in cases.
- When evaluating the number of doses, there was a similar distribution between cases, with $p = 0.512$. 45.4% were vaccinated with CoronaVac, 37.5% AstraZeneca, 13.6% Pfizer and 3.3% Janssen, $p = 0.552$.
- Among patients who took two doses, there was a significant difference between the time of onset of symptoms and the date of vaccination, median of 204 days for cases and 164 days for controls, $p = 0.011$.
- Multiple logistic regression analysis showed a significant association for the following variables:
 - Age group 30 to 39 years (OR_{adj} 3.37 95% CI 1.36-8.34), 40 to 49 years (OR_{adj} 2.79 95% CI 1.13-6.90), 50 to 59 years (OR_{adj} 5.03 95% CI 2.37-14.40) and ≥ 60 years (OR_{adj} 5.84 95% CI 2.37-14.41);
 - SARS (OR_{adj} 1.63 95% CI 1.03-2.58) and HIV (OR_{adj} 0.56 95% CI 0.36-0.82).
 - Vaccination with 1 or 2 doses presented (OR_{adj} 0.66 95% CI 0.30-1.46) and 3 or 4 doses (OR_{adj} 0.73 95% CI 0.33-1.61).

Figure 1 . Flowchart of case control study, factors associated with COVID-19, IIER, 2021 - 2022

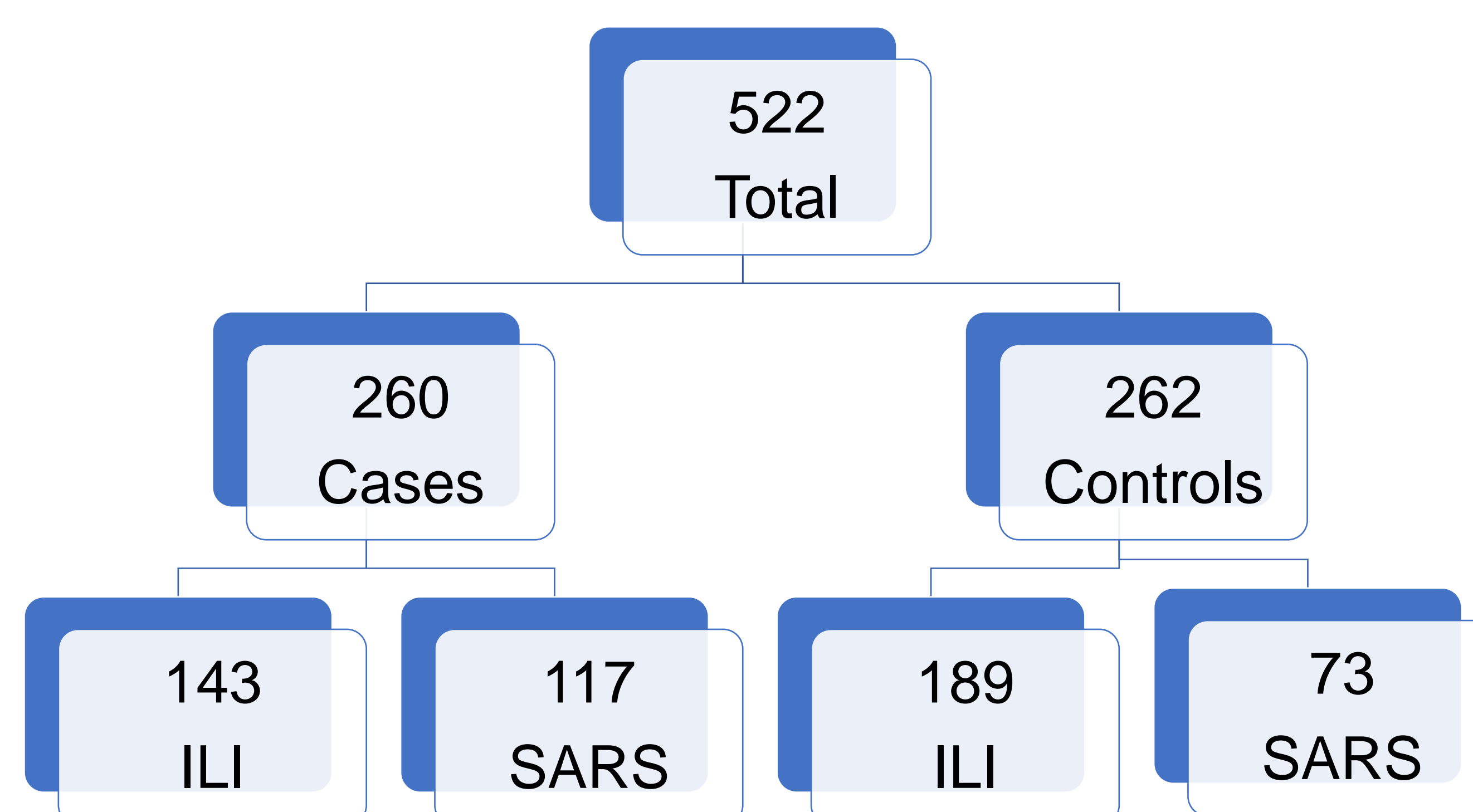


Table 1 . Multiple logistic regression analysis showed a significant association for the following variables – IIER, 2021 - 2022

Variables	Cases n ^o =260 (%)	Controls n ^o =262 (%)	OR _{adj} (95% IC)
ILI	143 (55)	189 (72,1)	
SARS	117 (45)	73 (27.9)	1.63 (1.03-2.58)
HIV +	73 (28.1)	105 (40.1)	0.56 (0.36 - 0.82)
Age Group (years)			
17 to 29	20 (7.7)	53 (20.2)	1
30 to 39	42 (16.2)	55 (21.0)	3.37 (1.36-8.34)
40 to 49	42 (16.2)	55 (21.0)	2.79 (1.13-6.90)
50 to 59	63 (24.2)	52 (19.8)	5.03 (2.37-14.40)
≥ 60	93 (35.8)	47 (17.9)	5.84 (2.37-14.41)
Vaccination*			
None	22 (8.5)	15 (5.7)	1
1 or 2 doses	79 (30.4)	85 (32.4)	0.66 (0.30-1.46)
3 or 4 doses	154 (59.2)	160 (61.0)	0.73 (0.33-1.61)

* 5 Ignored

CONCLUSIONS

The factors associated with COVID-19 in patients with ILI or SARS were: Age over 30 years and SARS. There was a lower proportion of HIV among cases than among controls (28.1 x 40.1). There was a high proportion of vaccination between the two groups, without statistical significance.