

EPIDEMIOLOGY OF VIRAL RESPIRATORY INFECTIONS IN PRE- AND DURING -COVID-19 PANDEMIC IN “R. DULBECCO” UNIVERSITY HOSPITAL OF SOUTHERN ITALY.

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INTRODUCTION

The COVID-19 pandemic highly impacted on the circulation, seasonality, and morbidity burden of several respiratory viruses. Since the respiratory virus infections (VRIs) prevalence may affect the clinical prediction and management resources, the aim of this study was to evaluate the impact of pandemic on frequency and circulation of respiratory viruses in a teaching hospital of Southern Italy in pre- and during-COVID-19 pandemic.

METHODS

A total of 3632 nasopharyngeal swabs from patients with suspected VRIs symptoms, collected between January 2017 and December 2023, were analyzed by BioFire®RP2.1 Plus (Figure 1) and QIAstat-Dx® Respiratory SARS-CoV-2 Panels (Figure 2). The samples processed before March 15, 2020, were considered "pre-COVID-19" and those from March 15, 2020 to December 15, 2023, were considered "during-COVID-19". Statistical analysis was performed by ChiSquare test ($p \leq 0.05$).

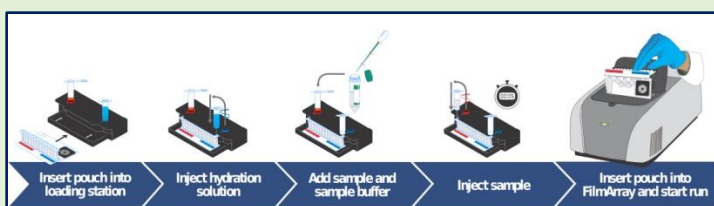


Figure 1. BioFire®RP2.1 Plus processing.



Figure 2. QIAstat-Dx® Respiratory SARS-CoV-2 Panels.

RESULTS

Overall, 749/3632 (21%) patients were positive for at least one respiratory virus, among them 456 (61%) were male, with mean age of 63 years (range 18-98).

The "pre-COVID-19" positive samples were 115/369 (32%), while "during-COVID-19" positive samples were 634/3263 (19.4%). Age stratification showed a significant positivity rate in >65 age group for both periods considered (64% and 55%, $p \leq 0.05$), respectively (Figure 3). Regarding viral targets circulation in "pre-COVID-19" group, Influenza A Virus was the most prevalent (59%) followed by Human Rhinovirus (HRV) (14%).

Interestingly, the spread of SARS-CoV-2 (58%, 366/634) from March 2020 onwards has led to markedly decrease of Influenza A Virus (59% vs. 4%; $p = 0.0001$) circulation, followed by a mild increase of HRV (14% vs. 25%, $p = 0.046$) (Figure 4). Viral co-infections were unchanged in both groups (about 5%).

In "pre-COVID-19" samples, the major percentage (60%, 3/5) of viral co-infection exhibited combinations of HRV plus Adenovirus and HRV plus Respiratory Syncytial Virus (RSV). In "during-COVID-19" group, HRV plus SARS-CoV-2 (35%, 13/37) was the main viral co-infection (Table 1).

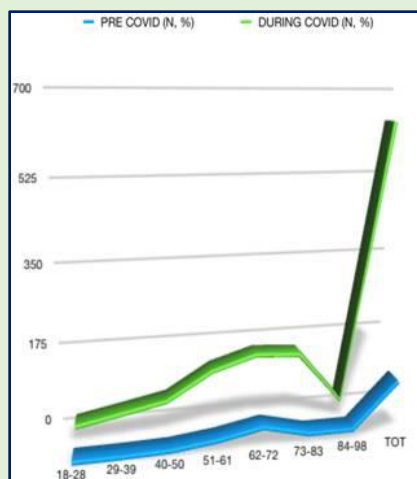


Figure 3. Age stratification of viral respiratory infections in pre-COVID-19 and during-COVID-19.

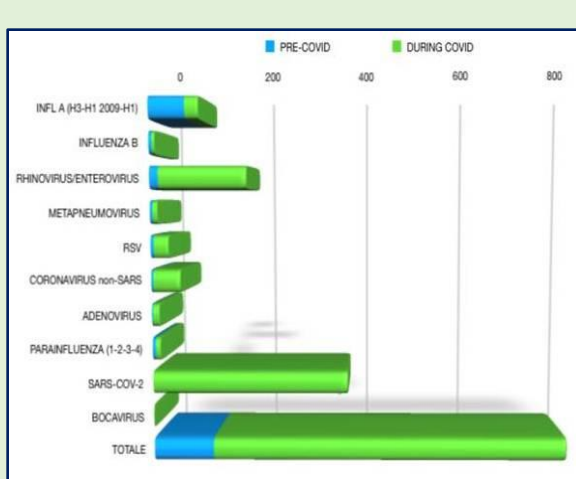


Figure 4. Viral targets circulation in pre-COVID-19 and during-COVID-19.

CO-INFECTION	PRE-COVID, N (%)	DURING-COVID, N (%)
METAPNEUMOVIRUS + INFL B	1 (20)	-
RHINOVIRUS/ENTEROVIRUS + RSV	1 (20)	1 (3)
RHINOVIRUS/ENTEROVIRUS + ADENOVIRUS	1 (20)	2 (5)
RHINOVIRUS/ENTEROVIRUS + CORONAVIRUS	1 (20)	1(3)
ADENOVIRUS + INFLA (H3)	1 (20)	-
RHINOVIRUS/ENTEROVIRUS + SARS-CoV-2	-	13 (35)
INFL A + SARS-CoV-2	-	2 (5)
RSV + SARS-CoV-2	-	5 (14)
METAPNEUMOVIRUS + SARS-CoV-2	-	1 (3)
CORONAVIRUS + SARS-CoV-2	-	8 (22)
METAPNEUMOVIRUS + RHINOVIRUS/ENTEROVIRUS	-	1 (3)
INFL B + RSV + SARS-CoV-2	-	1 (3)
ADENOVIRUS + SARS-CoV-2	-	2 (5)
TOTALE	5	37

Table 1. Viral co-infections in pre-COVID-19 and during-COVID-19.

CONCLUSIONS

COVID-19 pandemic and public health implementation of non pharmaceutical interventions have mitigated VRIs transmission. In agreement with scientific literature, we observed a notable decreasing of seasonal circulation of Influenza A Virus. Interestingly, we observed that RSV epidemiology remained unaltered in pre- and during-COVID-19 pandemic period and, in addition, we reported a predominant co-circulation of HRV with SARS-CoV-2. The spread of Omicron sub-lineages and the reduction of containment measures, are leading to a new increase of VRIs. Therefore, given that COVID-19 and influenza share the same high-risk groups, it is essential that the such individuals get vaccinated against both viruses.