ORIGINAL ARTICLE

NATIONAL JOURNAL NJMR MEDICAL RESEARCH

Clinical Evaluation of Omicron Subvariant BA.2: A Hospital Based Study

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Keywords:
Omicron,
BA.2,
Fever,
SARSCOV-2,
RTPCR,
Clinical Evaluation

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Date of Acceptance:
13/06/2023

DOI:
10.55489/njmr.13022023953

ABSTRACT

Introduction: Omicron is subdivided into BA.1 and BA.2. BA.2 appears to be more transmissible by nature. The new BA.2 sub variant is 30% easier to spread than the original omicron variant. Among those who are infected, headache, sore/itchy throat, sneezing, runny nose, and general body soreness are the most prevalent symptoms. Dizziness and fatigue are two more Omicron BA.2 sub variant symptoms. The aim of the study to evaluate the clinical variability of the BA. 2 sub-variants.

Material and methods: A retrospective study was conducted from December 2021 – March 2022 at VRDL, department of microbiology, R. G Kar medical college and hospital. Clinical features, demographic status, comorbidity status was evaluated.

Result: Common symptoms of BA.2 variants are headache, sore throat, fever, muscle pain shortness of breath, runny nose, fatigue, loss of taste, chest pain, diarrhea. The risk of severe disease was remained high for older persons and middle-aged men with comorbidities. Hospitalization was rare for this variant but affected more the unvaccinated infant group.

Conclusion: The future evolution of the BA.2 sub variant, as well as potential emergent sub variants, should be properly monitored. Omicron BA.2 will infect populations and become another common concerned variation.

INTRODUCTION

The Omicron variant in question is currently the most common variant circulating worldwide, accounting for virtually all sequences reported to GISAID. Omicron is divided into sub lineages, each of which is closely monitored by WHO and its partners. BA.1, BA.1.1 (or Next strain clade 21K), and BA.2 are the most prevalent (or Next strain clade 21L).[1] In recent weeks, the fraction of reported sequences classified BA.2 has risen in comparison to BA.1, while the global circulation of all variations is said to be dropping. BA.2 has a genetic sequence that differs from BA.1, including certain amino acid changes in the spike protein and other proteins. BA.2 has a growth advantage over BA.1 according to studies. BA.2 appears to be more transmissible by nature.[2] The new BA.2 sub variant is 30% easier to spread than the original omicron variant. Among those who are infected, headache, sore/itchy throat, sneezing, runny nose, and general body soreness

are the most prevalent symptoms.[3] However, and two more symptoms of Omicron BA.2 sub variant: dizziness and weariness.[4] Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has acquired a significant number of mutations that lead to changes in clinical manifestations and increased transmission.[5] The clinical picture of the same variant even changes with age and many other variables. This is very important to assess clinical variability to avoid complications.

Therefore, the aim of the study to evaluate the clinical variability of the BA. 2 sub-variants along with age and gender wise distribution of the same variant. The main goal of this study is to identify the most common clinical findings of a certain variant and to find a preventive method to reduce complications.

MATERIALS AND METHODS

Study site- A retrospective study was conducted from December 2021 – March 2022 at VRDL, department of microbiology, R. G Kar medical college and hospital. In the whole genome sequencing study 88 reported as sub variant of BA.2.

Study design and inclusion and exclusion criteria- patients reported at R G KAR medical college and hospital and positive for SARSCOV-2 with real time RTPCR were sequenced. Positive samples were sent to regional VRDL laboratory for sequencing. Samples tested BA. 2 (sub variant of omicron) were included in this study.

Sample size- 10161 SARSCOV 2 real time RTPCR were performed from January 2022 to March 2022. 1647 reports were positive for real time RTPCR. 124 Samples were sent for whole genome sequencing and 88 tested positives for omicron sub variant BA.2.

Sample collection and processing- detailed clinical history were taken from all the patients. viral nucleic acid was extracted from nasopharyngeal and oropharyngeal swab. 200 µL of the sample were taken from VTM and RNA extraction was performed by Magmax Viral extraction kit (Thermo Fisher Scientific). 50 µL of elution buffer was used to elute RNA. Real-time RTPCR was performed selecting the ORF and N quality. For 96 well one positive control (CPC) and one negative control were selected. Sequenced sample tested positive with BA.2 sub variant were selected and demographic information were analyzed for history of prior covid disease, co morbidity status, the onset of sickness, hospitalization status.

Diagnostic assays- Real time RTPCR test were performed with BIORAD CFX machine and whole genome sequencing were performed with sequencer.

Statistical analysis was performed by Microsoft excel.

RESULT

The aim of the study is to find out the clinical variability of the omicron variant BA.2. The main objective of this study is to find out the most common clinical findings of the specific variant and also to find a preventive method to reduce the complications. 10161 SARSCOV 2 real time RTPCR were performed from this study period. Out of 1647 positive sample 88 sample were positive for omicron sub variant BA.2.

Table 1 shows the common symptoms of BA.2 variants. Common symptoms are headache, sore throat, fever, muscle pain shortness of breath, runny nose, fatigue, loss of taste, chest pain, diarrhea. Other unusual symptoms are chills, altered smell, eye soreness, swollen glands, rash, hoarse voice.

Affected person age group was divided in 4 categories; age < 18 years, age ranges between 19-30 years, age ranges between 31- 55 years and older age group > 55 years.

Study shows that the most affected age group with this BA.2 variant was the older age group, followed by the age group between 19-30 years (table 2).

Table 1: Symptoms of BA.2 (Subvariant of Omicron) among study cases

Symptoms	Cases (%)
Running Nose	30 (34.1%)
Headache	60 (68.2%)
Fatigue	30 (34.1%)
Sneezing	50 (56.8%)
Sore throat	55 (62.5%)
Persistent cough	41 (46.6%)
Chills or shivers	11 (12.5%)
Fever	61 (69.3%)
Dizzy	4 (4.5%)
Altered smell	6 (6.8%)
Eye soreness	9 (10.2%)
Unusual muscle pain	61 (69.3%)
Loss of taste	20 (22.7%)
Chest pain	30 (34.1%)
Swollen gland	2 (2.3%)
Diarrhoea	30 (34.1%)
Rash	7 (8%)
Shortness of breath	40 (45.5%)
Hoarseness voice	2 (2.3%)

Table 2: Age wise distribution of omicron positive cases

Variables	<18 YRS	19-30 YRS	31-55 YRS	>55 YRS
Positives	8 (9%)	26 (30%)	21 (24%)	33 (37%)
Symptomatic	5 (62.5%)	25 (96.15%)	15 (71.43%)	26 (78.78%)
Asymptomatic	3 (37.5%)	1 (3.85%)	6 (28.57%)	7 (21.22%)

Table 3: Bar graph showing the hospitalization status of BA.2 variant

Hospitalization status	Cases (%)
Hospitalised	1 (1.1%)
Not hospitalised	87 (98.9%)

Table 4: Co-morbid status of the study cases

Co-morbidities	Cases (%)
Diabetes	37 (42%)
Hypertension	25 (28.4%)
Cardiac disease	7 (8%)
Renal disease	0 (0%)
Respiratory illness	14 (15.9%)
Neoplastic disease	3 (3.4%)
Pregnancy	2 (2.3%)

Interestingly out of 88 persons affected by BA.2 variant only 1 person was hospitalized and expired (table 3).

The common commodity among those positive samples were diabetes, and hypertension. Other comorbidities are cardiac disease, renal disease, respiratory illness, neoplastic disorder and pregnancy (table 4)

DISCUSSION

This present study showed that the infection with BA.2 sub variant of omicron were mostly symptomatic with a percentage of 81% (Table 1). The most common symptoms are headache, sore throat, fever, muscle pain shortness of breath, runny nose, fatigue, loss of taste, chest pain, diarrhea. Other unusual symptoms are chills, altered smell, eye soreness, swollen glands, rash, hoarse voice. Headache muscle pain and fever were the most common symptoms of the sub variant BA.2. Abdulla ET al[6], stated that, deaths and ICU admissions were 4.5 percent vs 21.3 percent (p <0.001) and 1 percent vs 4.3 percent (p<0.001) for the Omicron and preceding waves, respectively; length of stay was 4.0 days' vs 8.8 days; and mean age was 39 years' vs 49,8 years. Admissions peaked in the Omicron wave and then swiftly decreased, with peak bed occupancy at 51% of the prior peak in the Delta wave. Following a positive SARS-CoV-2 PCR test, 62 (63%) patients on COVID-19 wards developed incidental COVID-19. Only one-third of the patients (36%) developed COVID-19 pneumonia, with 72 percent having mild to moderate symptoms.

The remaining 28% required intensive care or admission to an ICU. In COVID-19 wards, less than half of patients (45%) required oxygen supplementation, compared to 99.5 percent in the first wave. The death rate is high.[7]

Similar finding was showed among the African population.[2]

The present study showed the most interesting thing of this variant is that out of 88 individuals only one hospitalization case was reported and patient was expired. Single hospitalized patient was reported had severe respiratory illness.

The risk of presenting to emergency care or being admitted to the hospital with Omicron was about half that of Delta (Hazard Ratio 0.53, 95 percent CI: 0.50 to 0.57). The possibility of being admitted to a hospital from an emergency department. Omicron (Hazard Ratio 0.33, 95 percent CI: 0.30 to 0.33) was about one-third of Delta (Hazard Ratio 0.33, 95 percent CI: 0.30 =-098721[8] Study from African population showed that in the early stages of the fourth wave in South Africa, a different pattern of features and outcomes was found in patients hospitalized with COVID-19 compared to earlier waves, with younger patients having fewer comorbidities, fewer hospitalizations, and lower respiratory rates.[2] COVID-19 immunization, including a booster dose, was linked to a decreased risk of intensive care unit admission in people hospitalized with SARS-CoV-2 infection during Omicron predominance.[9] Patients during the Omicron period had less severe sickness than patients during the Delta predominant period, owing to a higher number of completely immunized patients.[10] Non–COVID-19 conditions accounted for about 20% of early Omicron-period hospitalizations, especially among young and vaccinated people.[11] In contrast of these study Broadfoot et al stated that As the Omicron variation caused a surge of infections, the number of children hospitalized with COVID has risen dramatically in recent weeks, raising fears that the current strain of the corona-

virus may pose a higher hazard to youngsters.[12] If the recent alarming spike in COVID-19 case numbers observed globally did not translate to unmanageable increases in hospitalizations, it would provide reassurance to the public and health authorities that the risk of severe disease with the omicron variant[13], similar to that observed in England could be attributed to lower intrinsic virulence, it would provide reassurance to the public and health authorities that the recent alarming spike in COVID-19 case numbers observed globally did not translate to unmanageable increases in hospital.[14] Another study stated that someone infected with the omicron variant of SARS-CoV-2 is expected to be 31 percent to 45 percent less likely than someone infected with the omicron variant of SARS-CoV-2 to seek emergency care.[15]

Present study showed that omicron BA.2 sub variant mostly affected the older age group more than 55 years.30 % of the affected individual were 19-30 ears age group. 9% pediatric population were affected by the BA. 2 sub variants. According to ICMR study mean age of 44 years are mostly affected. Another study showed that during the Omicron period, children saw substantial relative increases in ED visits and hospitalizations, which could be due to lower immunization rates in children compared to adults, particularly among children aged 0–4 years who are currently not eligible for vaccination.[16], [1] According to a new study, the Omicron form of the coronavirus produces less severe sickness in very young children than the Delta variation.[17] Wang et al[16] stated that after the development of the Omicron variant, the risk of hospitalization in unvaccinated children under the age of five was one-third that of the Delta variant period (0.96 percent vs. 2.65 percent), whereas the risk of ED visit was less than one-fifth. Both differences were significant (21.01 percent). Russel stated that Infection rates are highest among children aged 5 to 11.[18]

Present study showed that among the 8 pediatric patients 5 were symptomatic with fever and breathlessness. Out of 8 pediatric patients 7 were less than 5 years and one were 9-year-old child. Results indicate that omicron sub variant BA. 2 affects mainly the infant population. According to the Indian Pediatric Society, at least 31 children with comorbidities who have tested positive for Covid-19 have been hospitalized in Delhi. Eight of these kids have mentioned having seizures and having low blood pressure, while all the other kids had comorbid conditions.[4],[19]

Present study reported that most common comorbidity among the BA.2 positives was diabetes, followed by hypertension, respiratory illness. Few cases were reported with renal disease, neoplastic disorder and only pregnancy case was reported. Kahn et al[20] reported that During Omicron, the risk of serious disease was lower than during Delta, although it remained high in older adults and middle-aged males with comorbidities. Zhang et al[21] stated that Only elderly and comorbid patients were susceptible to omicron, according to the findings. Older study[20] reported that during the Omicron period, the risk of severe disease was also lower for unvaccinated cases, but it remained high for older adults and middle-aged men with comorbidities.

CONCLUSION

The risk of severe disease was similarly lower for unvaccinated cases during the Omicron period, but it remained high for older persons and middle-aged men with comorbidities. Hospitalization was rare for this variant but affected more the unvaccinated infant group. However, future evolution of the BA.2 sub variant, as well as potential emergent sub variants, should be properly monitored.

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