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# **A Syndromic Approach to the B.1.1.529, 20K (Omicron) Variant Driven SARS-COVID-19 fourth Wave in Patients in a Private Health Care Setting in South Africa**

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# A Syndromic Approach to the B.1.1.529, 20K (Omicron) Variant Driven SARS-COVID-19 fourth Wave in Patients in a Private Health Care Setting in South Africa

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## Abstract

**Introduction:** The COVID-19 pandemic has had a global impact on travel, tourism, businesses, economies, and capital in general. In South Africa, COVID-19 continues to impact the economy, lives, and livelihood of its citizens. COVID-19 has also brought on some financial pressures on the health sector with poorly resourced communities worse affected. The Omicron variant though associated with low mortality and morbidity still possess danger for many in SA. This study suggests ways in which a collection of peculiar signs and symptoms could be used to make a presumptive diagnosis of COVID-19, specifically of the Omicron variant in a resource-limited setting, so that isolation and treatment can be started empirically to prevent community spread.

**Methodology:** This case series looks at 12 out of 22 patients seen in a private health care setting in Pretoria, SA. It ascertained clinical signs and symptoms common with the Omicron variant of COVID-19 compared to its preceding variants. Descriptive statistics were used to synthesize the data, and findings reported.

**Findings:** This study suggests that patients presenting with respiratory or gastrointestinal symptoms with fever and chills, and severe pain in more than 3 sites of the body could be provisionally diagnosed as COVID-19 of the Omicron variant in areas of high prevalence. Such patients could then be treated and isolated until their symptoms subside without expensive laboratory testing in resource-limited settings where the COVID-19 RT-PCR or Antigen testing is unaffordable or unavailable.

**Conclusion:** A syndromic approach to diagnosis and treatment of COVID-19 of the Omicron variant or sub-variant, and probably newer variants could be adopted in a resource-limited setting to provisionally diagnose treat and isolate patients to prevent rapid community spread and exorbitant cost to the health sector.

## Introduction:

### Background:

Since the onset of the SARS-CoV-2 (COVID-19) pandemic, South Africa (SA) has recorded more than three million infections and more than ninety thousand deaths (NICD, 2022). South Africa has also seen four different waves driven by different variants of the virus. Variants arise by mutations in the Viral RNA that can sufficiently influence the way the virus behaves; its epidemiology, virulence, demographics, severity of disease, transmissibility, morbidity, and mortality (Bekker & Ntuli, 2021).

According to the NICD (2020), in March 2020 countries around the world including SA became aware of the SARS-COVID-19 Virus. In May South Africa announced the arrival of COVID-19 and in July 2020 entered its first wave, with a peak positivity rate of 27% (NIDC, 2021). The beta variant drove the second wave in SA with increased transmissibility and virulence, it outstripped health systems, including private and public hospital beds, and oxygen supply (Bekker & Ntusi, 2021). The delta and gamma variants were documented in India (October 2020) and Brasil (November 2020) respectively (WHO, 2022).

According to WHO (2022), The third wave in South Africa was driven by the delta variant. It was aggressive, rapidly spreading, and virulent leading to high bed occupancy due mainly to its impact on respiratory function. This led to overcrowded health facilities, increased oxygen demands, and high mortality (Bekker & Ntusi, 2021). The effect of COVID-19 on the respiratory function in the first three waves led to high bed occupancy, morbidity, and mortality due mainly to Acute respiratory distress syndrome, pulmonary embolism, Bronchitis, and COVID Pneumonia (Lee et al.,2021). These 3 waves also impacted adults above 30years mainly (Maluleke, 2020).

When the Omicron variant-driven fourth wave started in SA, little was known about it. The fourth wave in SA arrived when about a quarter of the illegible population was vaccinated. This variant was first discovered in Botswana and then SA (Schreiber, 2021). Islam &

Hossain (2021) raised concerns that the mutations in the new Omicron variant would influence laboratory diagnostics, clinical presentations, Immunity gained from existing vaccines, and public health protocols used for the management of the three previous waves. However, as the world slowly learned, the Omicron Variant showed increased transmissibility and caused less severe disease compared to the previous variants (Wolter et al.,2022).

At a societal level, COVID-19 posed a threat to lives, livelihood, economies, and global health. Many Pharmaceutical companies began the production of vaccines for COVID-19 once the impact of this virus became apparent to the world. As vaccines became available in many countries, their uptake improved, and businesses and tourism improved slowly.

However, when SA and Botswana announced the discovery of the Omicron variant (Schreiber, 2021) several countries imposed travel restrictions and border closures as this variant was anticipated to be worse than others (Islam & Hossain, 2021). These measures were taken against SA by the UK and many other countries, even when the government had started rolling out vaccines in many health facilities, targeting citizens with special needs, above 60years of age, people with serious comorbidities, and Health Care Workers (CDC, 2021).

The more Physicians, Pathologists, Laboratories, and other stakeholders in the Health Sector gain knowledge about the COVID-19 virus, they realized that COVID-19 may be with us for a long time. Various stakeholders became interested in cost-saving and management protocols, especially given the rapid spread of Omicron (Cleary et al.,2021).

In the previous three waves, Clinicians observed predominantly symptoms like dry cough, fever, tiredness, difficulty breathing, chest pain, and cases of pneumonia were predominant in hospitalized patients (Moein et al.,2020). As scientists and Clinicians learned more about the Omicron Virus a clinical picture different from the previous variants started to emerge; the omicron virus appeared to have signs and symptoms in specific body systems that differed from the other three variants.

At the start of the Omicron wave, there was a rapid rise in COVID cases in health facilities in Pretoria, Gauteng Province, SA. In a Family Practice in Pretoria, it was observed that within 2 weeks of the fourth wave that there were 22 positive cases, there was no hospitalization, no patients came in with respiratory distress, and no deaths as was with the previous variants and waves. In addition, the clinical

presentation was different with severe pain in multiple parts of the body, diarrhea, fever, and chills featuring prominently.

This case series presents the clinical signs and symptoms of patients diagnosed by RT-PCR during the Omicron-driven COVID-19 fourth wave. It demonstrates how patients with the Omicron virus differed in clinical presentation; organ systems affected most, symptomatology, and signs from the preceding waves and variants.

The presenting complaints of the earliest patients seen at the beginning of the fourth wave in a private health care setting in Pretoria, SA was documented and described in this series. This case series aimed to demonstrate what common clinical symptoms patients presented with during the fourth wave, their severity, and duration of illness. It also demonstrated how a syndromic approach could be used to make a presumptive diagnosis of COVID-19, specifically caused by the Omicron variant. This became important as the treatment cost to medical insurance and private individuals increased rapidly during COVID-19 waves.

#### **Problem Statement:**

1. What are the differences in clinical presentation between the omicron variants of the SAR-COVID-19 virus from the previous variants?
2. Are there specific symptoms and signs that may have a high positive predictive value for the Omicron variant of the COVID-19 virus?

#### **Aim of study:**

1. Demonstrate the differences in the clinical presentation of the Omicron variant compared to previous variants?
2. Highlight the differences in presentation of the Omicron Variant compared to the other strain that can assist clinicians to adopt a syndromic approach to its diagnosis.

## Methodology

#### **Methodology:**

This study is a case series of patients seen in a standard and well-equipped private family practice at the onset of the fourth wave, driven by the Omicron variant in Pretoria, South Africa in November 2021. A case series is a quantitative observational study where a clinician presents the specific cases of similar problems or specific problems of different cases. The findings are then described, synthesized, and

summarized. Case series are useful tools for clinicians to document different responses, presentations, and diagnoses of diseases.

The family practice where the cases in this series emanate is located in Pretoria Central, but sees undifferentiated patients from various surrounding urban and suburban communities around Pretoria such as Mamelodi, Atteridgeville, Mabopane, Pretoria west, Soshanguve, and Garankuwa. The patients were investigated for COVID-19 during the fourth wave. All 22 patients were seen and confirmed by COVID-19 PCR in the first week of the government declaring that South Africa was in its fourth wave in November 2021.

They presented with various symptoms including multiple areas of severe pain, cough, fever and chills, diarrhea, sore throat, tiredness, and runny nose. A nasopharyngeal swab was taken at the practice and couriered to the laboratory. Out of the 22 patients confirmed positive, only 12 cases met the inclusion criteria in this series.

All patients in this series were put on a minimum of Prednisolone 15mg given three times daily, paracetamol 1g 3 times daily, and diclofenac 50mg three times daily all for 3 days. However, the effect of this on recovery is outside the scope of this study.

Inclusion Criteria:

1. Confirmed COVID-19 cases through RT-PCR
2. Ages between 18-50 years
3. No co-morbidity, or comorbidity controlled on treatment.
4. Patient that graded their pains at the time of presentation on day 1, and provided a pain grading when they returned for follow-up or by phone call on the 8th day.
6. Unvaccinated or vaccinated at least 3 months before current symptoms.

## RESULT

### Result:

<p><b>Table 1</b> Patient A: A 38yr old vaccinated HIV positive female. She presented with Diarrhea, no cough, no dyspnea, but had a fever. Other Vital signs were normal. Had Pain: Body Pain (Myalgia), thigh pain (could not sit down), sore throat, headache, chest pain, and abdominal pains. Graded pain 10 (day 0) and day 8(1). Examination: Agitated, could not sit due to thigh pain. Temperature was 38.5degrees. No other abnormality were detected. A COVID RT-PCR swab was positive. It took 8 days to recover.</p> <p>Patient B: An unvaccinated 22yr old female with no co-morbidity. She presented with Diarrhea fever and Pain. Pain: Body Pain including Back pain, Sore throat, chest pain. Graded pain: 8 (day 0) and 0 (day 8). Examination: No other abnormalities were detected. A COVID RT-PCR swab was positive. It took 8 days to recover.</p> <p>Patient C: A 18yr old unvaccinated HIV Positive male presented with Cough, Fever, Body Pains, Back Pain, Headache, and Sore throat. Graded pain: 7 (day 0) and 0 (day 8). Temperature=37.7. Examination: No other abnormalities were detected. A COVID RT-PCR swab was positive. Recovery time was 7 days.</p> <p>Patient D: A 48yr old unvaccinated HIV Positive, male presented with fever, Diarrhea, Pain: Body Pain, Headache, and generalized musculoskeletal pain. Graded pain: 8 (day 0) and 0 (day 8). Temperature=38 degrees. Examination Positive findings: mild dehydration. Vital signs normal. It took 8 days to recover. COVID PCR swab was positive.</p> <p>Patient E: A 20yr old unvaccinated male with no comorbidity presented with fever, cough, Body pain, Sore throat, Headache. Generalized body pain especially at the back. Graded pain: 8 (day 0) and 0 (day 8). Examination: No other abnormalities were detected. COVID RT-PCR swab was positive, and recovery took 6 days. Temperature=37.5 degrees.</p> <p>Patient F: A 23yr old vaccinated female with no comorbidity presented with: fever, cough, Pain-Joint pain, body pain, headache, and sore throat. Graded perceived pain scale: 8 (day 0), 0 (day 8). Temperature =38.1 degrees Examination: No other abnormalities were detected. A COVID RT-PCR swab was positive. Recovery took 6 days.</p> <p>Patient G: A 29yr old unvaccinated female with no co-morbidity presented with cough and fever. Pain: Body pain, joint pain, sore throat, headache. Graded perceived pain: 8 (day 0) and 0 (day 8). Temperature=38 degrees. Examination: No other abnormalities were detected. A COVID RT-PCR swab was positive. Time to recovery took 6 days.</p> <p>Patient H: A 39yr old unvaccinated Hypertensive male with and history of 10 pack years of Cigarette presented with cough and fever. Pain: Severe body pain, Sore Throat, and Headache. Graded perceived pain scale: 10 (day 0), 0 (day 8). A COVID RT-PCR swab was positive. Recovery took 8 days. Temperature=38 degrees. Blood pressure was 133/75mmHg and had Wheezes in the chest. Examination: No other abnormalities were detected.</p> <p>Patient I: A 43yr old vaccinated female with no co-morbidity presented with cough and fever. Pain: generalized body pain and headache. The graded perceived pain scale was 8 (day 0) and 0 (day 8). Examination: A COVID RT-PCR swab was positive. Recovery took 6 days. Temperature=38.3 degrees. No other abnormalities were detected.</p> <p>Patient J: A 36yr old unvaccinated female without co-morbidities presented with cough, fever, tiredness and Pain: Generalised body pain, headache, chest pain and sorethroat. Graded perceived pain scale as 10 (day 0) 0 (day 8). Temperature=38 degrees, Examination: No other abnormalities were detected. A COVID RT-PCR swab was positive. Recovery took 10 days.</p> <p>Patient K: A 39yr old vaccinated female without co-morbidities presented with cough, fever, Pain: body pain, sore throat, headache, back pain. The graded perceived pain was 7 (day 0) 0 (day 8). Examination: Temperature=37.8 degrees. No other abnormalities were detected. A COVID RT-PCR swab was positive. Recovery took 6 days.</p> <p>Patient L: A 23yr old vaccinated female presented with cough, fever, Headache, sore throat, joint and back Pain. The graded perceived pain scale was 9 (day 0), 0 (day 8). Recovery took 6 days. A COVID RT-PCR swab was positive. Temperature=38.3 degrees. Examination: No other abnormalities were detected.</p>
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Figure 1: Gender:

Figure 1: Gender:

Male	6
Female	6

Figure 2: Age

Figure 2: Age

< 18	0
18 &#226; 35	6
35 &#226; 50	6

Figure 3: Co-Morbidities:

Figure 3: Co-Morbidities:

No Co-morbidity	8
Hypertension	1
HIV Positive	3

Figure 5: Vaccination Status:

Figure 5: Vaccination Status:

Vaccinated	5
Unvaccinated	7

Figure 4: Pain Grade:

Figure 4: Pain Grade:

	Day 0	Day 8
0	0	11
1-6	1	1
7 &#226; 9	9	0
10	3	0

## Analysis

### Data Analysis:

Data analysis was done using descriptive statistical methodology. The age, gender, vaccination status, Co-morbidities (HIV and Hypertension), previous immunization status, site of pain, and other respiratory symptoms were extracted from the patient's file.

This series reviewed 12 patients out of 22 patients seen and tested positive for COVID-19 during the Omicron wave. Out of the 12, six were males and six were females. All patients reviewed were between the ages of 18-50 years.

The course of a covid-19 wave depends on the vaccination status, virulence, transmissibility of the strain, and patient's comorbidities. Out of the 12 patients reviewed 4 patients had comorbidities; 3 HIV positive and one hypertensive. Among the patients reviewed, seven were unvaccinated while five were vaccinated with at least a single dose of vaccine 3 months before the consultation.

Pain feature prominently in this review. Out of 12 Patients reviewed 11 had pains in at least 3 regions of the body. Eleven out of the 12 patients reviewed graded their pain as severe- they graded their pain at least 7 out of 10 at the time of presentation, but on the 8th day, 11 of the patients graded their pain as 0.

Three patients presented with diarrhea. Patients presenting with diarrhea did not present with respiratory symptoms. They did not have a cough, sore throat, or running nose. Cough was not a

constant symptom of the Omicron variant; of the 12 patients reviewed 9 had a dry cough while the other 3 did not have cough at any time during the disease. The days taken for vaccinated patients to recover were shorter with most vaccinated patients recovering between 5-6 days, and unvaccinated patients taking between 7 to 10 days.

#### **Discussion:**

There is little evidence that specific strains of COVID-19 are associated with specific clinical presentations. Although previous variants including the alpha, beta, and delta all caused severe respiratory distress leading to high admission rates and increased use of oxygen during treatment. In this case series, none of the patients reviewed had respiratory distress. This finding is supported by Moein et al.,(2020) who had similar findings when symptoms of Omicron patients were compared to the previous variant.

In this case series, all patients presented with fever and chills, and pains. Symptoms associated with pains featured prominently; patients presented with severe pain for example sore throat, joint pain, headache, body, chest, back, and generalized musculoskeletal pain. 11 of the 12 patients reviewed had pains in at least 3 sites of their body, and one presented with pain in two sites. Areas of pain included headache, sore throat, chest wall pains, abdominal pain, back pain, joint pain (Arthralgia), and generalized muscle pain (Myalgia). Moein et al.(2020) also demonstrated a similar finding in their study. The significance of this is not clear, but this may suggest that clinicians can provisionally diagnose COVID-19 where a patient presents with severe pain in various parts of the body with respiratory or gastrointestinal symptoms.

Unvaccinated patients appeared to present with more severe pain than their vaccinated counterparts in this study. According to Bekker and Ntusi (2021), The first, second, and third waves of COVID-19 in SA and the rest of the world was associated with significant mortality and morbidity. As a result, South Africa experienced high hospitalization, bed occupancy, and unprecedented oxygen shortages. Although the uptake of Vaccination has been slow, Islam and Hossain (2020) suggest that the fourth wave by the omicron virus has had far less impact on the lives and livelihood of South Africans. This may be due to vaccine uptake, acquired immunity by people with asymptomatic infections, vaccination, and previous known infections. In this review, it appeared that vaccinated patients recovered faster than unvaccinated patients.

The cost of the RT-PCR test makes its accessibility

and availability limited in poor communities and countries especially in Africa(Connor et al.,2021). The cost of the COVID-19 PCR or Antigen test in South Africa makes it difficult for patients that cannot afford private health facilities to access easily in often overcrowded government clinics and hospitals (Connor et al.,2021).

Considering the mild presentation of Omicron, the question that arises is, is it reasonable to consider testing patients with mild to moderate symptoms of COVID-19? From the review, the Omicron variant did not cause difficulty breathing in any patient. In the absence of this and other severe symptoms, most patients are not referred for admission and did not need oxygen (Islam & Hossain, 2021). It appears that the Omicron variant caused a less severe disease than the variant responsible for the preceding waves.

In poor communities in SA and Africa medical personnel, treatment and medication are either absent or insufficient (Connor et al.,2021). This has led to rapid community infections and preventable morbidity and mortality. The specific diagnosis of COVID-19 without the necessary resource in the community is difficult. To administer treatment early and isolate, diagnosis is necessary, but most communities do not have the resources for these.

This case series suggests that the clinical presentation of Omicron is somewhat different from its preceding variants and its differential diagnosis including common cold, influenza and allergic rhinitis, and other respiratory tract infections. Apart from the respiratory symptom, Patients with the Omicron variant are more likely to present with severe pains in three or more areas of the body, fever, and chills. Therefore, for poor communities and countries where COVID-testing is unavailable and inaccessible, a syndromic approach can be applied to diagnose COVID-19, especially of the Omicron variant.

Further, given the increased reinfection of vaccinated persons and the rapid spread of Omicron, it may be difficult for communities without resources to test and treat everybody. In poorer countries, governments are unable to meet the large demands for vaccines and testing. A syndromic approach will allow health workers to provisionally diagnose and treat COVID-19 with a collection of signs and symptoms; the presence of a respiratory symptom, diarrhea, fever associated with chills and severe pain in 3 or more areas of the body in a patient could be treated as COVID-19 at presentation without a laboratory diagnosis in a resource-limited setting. This will make it possible for health workers to ask patients to isolate themselves.

Family Practitioners in rural areas where laboratory facilities and resources are scarce must view patients with multiple sites of severe pains and fever associated with chills with a high index of suspicion to decide on treatment options and counsel patients for possible isolation till their symptoms subside. While due diligence needs to be paid to other differential diagnoses like allergic rhinitis, influenza, and the common cold, it is expected that in an environment with a high prevalence of a disease there is a high positive predictive value for a set of symptoms and signs to be caused by that disease.

This case series merely presents cases that are mutually exclusive to one another, and a careful analysis was done to find commonalities between cases in a medical setting; therefore rigorous measures were not taken to improve the internal validity. However, Chokkora et al.(2021) suggest that good inclusion and exclusion criteria can guide researchers, and improve internal validity. This series had a clear set of inclusion criteria that guided patients included in the series.

Appropriate measures were not taken to reduce the effects of bias, confounding, and chance, but the use of patients presenting in the same practice, same population groupings, and similar symptoms helped improve the internal validity of the study results. The cases were presented as seen in a particular medical setting, and as such the results cannot be generalized (external validity) to other populations' groupings.

No written informed consent was obtained, but verbal consent from patients to be called on the 8th day if they cannot return was obtained. Further, the personal identifiers of patients were not presented in this series. No ethics committee approval was sought as issues of autonomy, beneficence, non-maleficence and distributive justice were not prominent in this series, and information extracted from respondent's files are kept in custody in a secure filing store.

#### **Recommendation:**

This study used only descriptive statistics and no inferential statistics, therefore no inferences can be made with the findings. It is important to conduct studies to provide better empirical evidence on the syndromic approach in the treatment of omicron-driven COVID-19 or any new variant or sub-variant in a resource-limited setting.

The statistical significance of the results was not tested; hence it is recommended that further quantitative studies with larger population samples be done to further elucidate the findings in this series.

Despite the above, the clinical significance and

implication of this series are important for practitioners and health care workers to know when, how and who to test, treat, isolate or refer. It can assist in cost-saving in laboratory fees.

Further studies need to be conducted in the area of a treatment protocol for patients with COVID-19 of the Omicron variant. This will reduce the cost of a plethora of multivitamins and minerals with questionable clinical benefits. In this study, Prednisolone 15mg was given three times daily, paracetamol 1g 3 times daily and diclofenac 50mg three times daily, with all patients recovering by the 8th day. Whether this led to a faster recovery is outside the scope of this study.

At a societal level, the use of a syndromic approach will provide a clear understanding of the way omicron presents. It will make it possible for persons to recognize these symptoms and self-isolate, even without access to health facilities or health care workers.

#### **Conclusion:**

This case series highlights the difference in the presentation between the Omicron variant of the SARS-COVID-19 virus and other variants. It demonstrated that patients presenting with upper respiratory tract infection or gastrointestinal infection symptoms with severe pain in more than 3 areas of the body, with fever and chills can presumptively be diagnosed and managed as the Omicron driven COVID-19, especially in a resource-limited setting given the high prevalence.

The use of a syndromic approach for the diagnosis of the Omicron-driven COVID-19 can remarkably reduce laboratory costs and prevent community infection by early diagnosis, isolation, and treatment.

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