

# Chronicles of the Covid Pandemic in Sohar: Evolution unfolded

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## **Aims**

The globe has been witnessing one of its most challenging health disasters, the covid pandemic, having created the highest impact on human life, world economy and health care from December 2019. The aim of this initiative was to reduce and prevent these catastrophic outcomes in pregnant women. This initiative demonstrates managing clinical risk reactively and proactively and engaging with patients and carers for patient safety

## **Approach**

A strategic approach using scientific unity and communication internationally, sharing of data, laboratory, diagnostics, virology, knowledge exchange, multidisciplinary team involvement, periodic revision of covid management protocols as the disease evolved played a key role in managing the pandemic in Sohar.

57 cases were randomly reviewed, 32 cases in 2020 and 25 cases in 2021.

## **Results**

In the first phase there was no maternal mortality although there were patients requiring mechanical ventilation and ICU care. Extent of pneumonic infiltrates on X ray chest, high CRP, LDH, Ferritin, NLR ratio, lymphopenia were the clear predictors of severe disease. The second phase witnessed five maternal mortalities in succession due to late presentation to the hospital with severe covid pneumonia in a critical condition.

Target Population Pregnant women presenting with covid symptoms and covid PCR positive

## **Outcomes**

95.5% of the mothers survived this pandemic during from February 2020 till date. 84% were found to be with mild disease, 8% were found to have moderate and 8% were found to have severe covid. Supportive management, MDT input, proning and treatment with antivirals, antibiotics, IL6 blockers, steroids and LMWH and preterm termination were the main stay. Cesarean section rates increased to 45%, iatrogenic preterm deliveries amounted to 4%, resulting in increased cost burden due to prolonged stay in SCBU resulting in severe bed crisis. Continuing health education and promoting vaccination drives and intermittent lockdowns helped in curbing the infection rates.

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## **I. Background**

The global number of SARS COV2 cases have been escalating with over 4.4 million cases reported in the past week (9 – 15 August 2021), bringing the cumulative number of globally to cases to over 206 million. SARS COV2 pneumonia was identified for the first time in Wuhan,<sup>1</sup> The impact this disease on pregnant women was going to be profound, parturient were at a higher risk of morbidity and mortality. A series of guidance documents were published to aid clinicians to guide through this unknown path, from various bodies like FIGO, RCOG, ACOG. The increase in deaths in ventilated adults in ICU of the general population affected by covid pneumonia created a scare and prompted us to initiate this patient safety project for preventing maternal mortality.

The issue was lack of knowledge of the clinical presentation, pathophysiology of covid pneumonia, lack of resources like drugs, personal protective equipment's, shortage of ICU beds and lack of community education and awareness of the severity of the pandemic.

As the disease evolved, a better understanding of symptoms and signs and laboratory investigations to aid early diagnosis and initiate early treatment helped in the management

PPE were made available. Education was provided and new Covid wards and ICU beds were recruited to accommodate the patients.

Currently there is no definitive evidence-based guidance specific to pregnant women regarding the evaluation or management of COVID-19.<sup>6</sup> The US Centers for Disease Control and Prevention (CDC) has

stated, based on the information currently available, that pregnant women seem to have the same risk as adults who are not pregnant.<sup>7</sup>

**Aim**– To decrease the maternal morbidity and mortality in those affected by SARS CoV 2 virus and ensure safe maternity services

## **II. Methodology process**

In February 2020, Sohar hospital experienced a sudden spike in covid cases and covid related severe morbidity and mortality of 90% of the adults needing mechanical ventilation. We performed the data extraction of all the covid positive per results in pregnant mother from February 2020 to July 2021, through the medical records. A group of reviewers resolved the discrepancies. The author prepared the data collection proforma. Four of them collected data and Staff from the training centre entered the data in excel format. The statistician analyzed the data through SPSS version 17. Demographic data, obstetric scores, comorbidity, symptomatology and signs at presentation, laboratory investigations, imaging studies, drugs used for treatment, delivery timings, clinical course, ICU care details were charted.

The patient safety topic that our initiative aligns with is managing clinical risk reactively and proactively, using quality improvement tools to improve care outcome and engaging with patients and cares for patient safety.

The challenges we faced were shortage of PPE, shortage of certain drugs like Tocilizumab, Remdesivir, shortage of covid wards and beds in ICU, absence of clear protocols in accident and emergency at first presentation of covid pregnant patient.

Rearrangements of beds available for covid cases, dividing the labor room into two covid and nonviewers, triaging covid patients separate, stopping elective gynecology surgeries, temporary cessation of infertility clinics were some of the measures taken to address the challenges

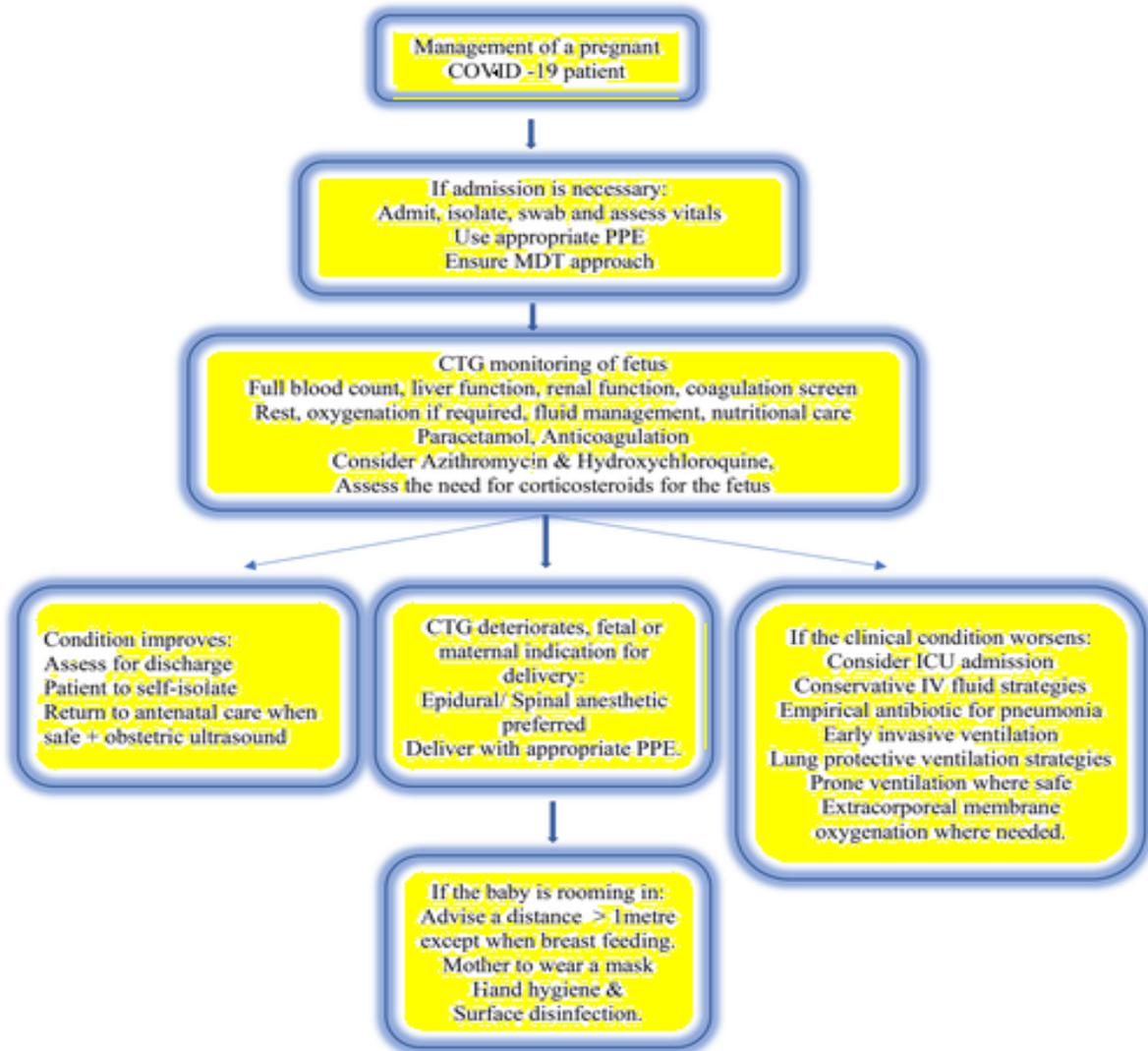
PPE stock was made freely available which built up the trust of health care professionals

The HCW were divided into two teams so that one team only would attend the hospital alternatively so as to reduce the exposure.

Health care professionals safety, mental and psychological health safety, patient transport safety, biosafety of laboratories and facilities were challenges that were addressed efficiently.

A clear flow chart and algorithm was designed for the diagnosis, investigations and admission of covid positive mothers from the receiving room.

Flow chart with the clinical definition of mild moderate and severe covid pneumonia



<b>MILD</b>	<b>MODERATE</b>	<b>SEVERE</b>
Fever, cough ,Sore throat , Malaise, Headache ,Muscle pain without SOB , Dyspnoea on exertion , <b>SPO2 - 94 % to 98 %</b> on room air , Respiratory rate – ≤20 /MIN <b>(Normal)</b>	<b>SPO2 ≥ 93 %</b> on room air , Respiratory rate 24-30/MIN <b>(Tachypnoea)</b>	<b>SPO2 &lt;93 %</b> on room air , <b>Respiratory rate &gt;30/MIN</b>

Tables and Graphs  
Table 1

Table 1. An overview of the most common symptoms observed in pregnant women with confirmed COVID-19

	<u>Dashraath et al.10 (%)</u>	<u>Yu et al.11 (%)</u>	<u>Chen et al.12 (%)</u>	<u>Elshafeeve al.13 (%)</u>
Fever	84	86	75	67.3
Cough	28	14	73	65.7
Dyspnea	18	14	7	7.3
Diarrhea		14	7	7.3
Lymphopenia	38		44	14
<u>Leucocytosis</u>	22			
Others: nasal congestion, rash, sputum, headache, loss of appetite			6	<5

Table 2- No of cases studied in 2020 and 2021

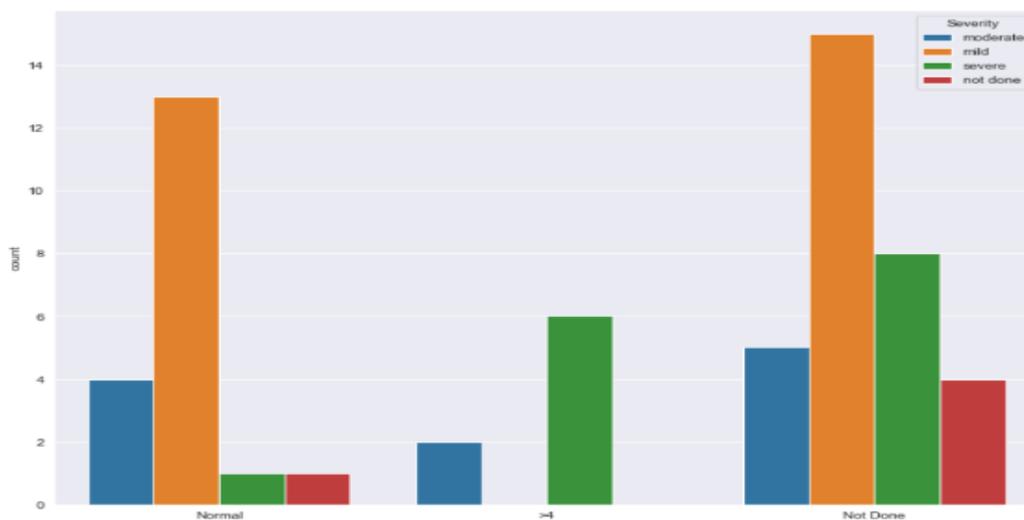
		DOA			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	2020	32	54.2	56.1	56.1
	2021	25	42.4	43.9	100.0
	Total	57	96.6	100.0	
Missing	System	2	3.4		
Total		59	100.0		

Table 3- no of cases received steroid and LMWh

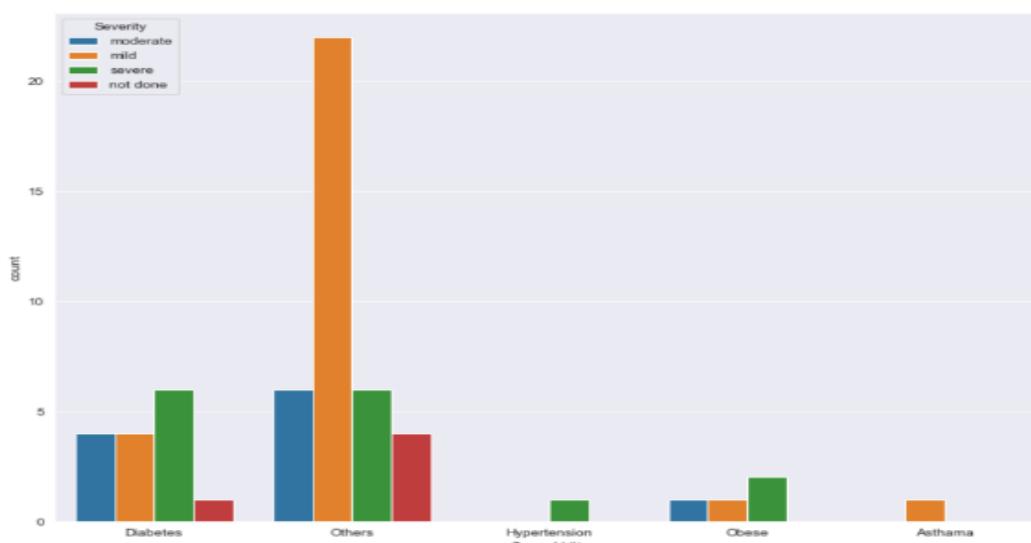
		dex1			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0	53	89.8	89.8	89.8
	1	1	1.7	1.7	91.5
	3	1	1.7	1.7	93.2
	8	2	3.4	3.4	96.6
	12	2	3.4	3.4	100.0
	Total	59	100.0	100.0	

		lmwhbefolmw			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	41	69.5	69.5	69.5
	No	1	1.7	1.7	71.2
	NO	2	3.4	3.4	74.6
	yes	5	8.5	8.5	83.1
	YES	5	8.5	8.5	91.5
	yes1	1	1.7	1.7	93.2
	yes10	2	3.4	3.4	96.6
	yes19	1	1.7	1.7	98.3
	yes29	1	1.7	1.7	100.0
	Total	59	100.0	100.0	



Graph 1 NLR ratio as predictor of severe disease.Green bar severe Orange mild red not done Blue moderate



Graph 2 Diabetes Hypertension and obesity shown to be clearly associated with severe cases

### III. Results

The flow chart and division of the accident and emergency into covid and non-covid reduced the waiting time of the patients by 50%. The algorithm helped to direct the patients to the appropriate care team without delay and initiate the management. A multidisciplinary input optimized the treatment of the patient to have good outcomes.

Involving patient and patient carers, anesthesia and ICU team in decision of termination of pregnancies helped in taking appropriate decisions.

Out of 57 cases reviewed, 45 were mild 7 were moderate and 5 were critical. 6 were admitted to ICU out of which one survived. Most of the mild cases received Azithromycin/hydroxychloroquine for 3- 5 days and were quarantined for 2 weeks.

45 % of the moderate and severe cases required cesarean delivery mostly for maternal sake others were for fetal distress. 3 of the severe cases received Tocilizumab and 1 received plasma therapy. Most of the mild cases received Lmwh for 10 days and all moderate and severe cases received Lmwh till and after delivery.

5 patients who did not survive presented with severe covid pneumonia and desaturation and extensive infiltrates in lungs, had preterm cesarean section and deteriorated after cesarean. The indirect cause of death in 2 of them was sepsis and the rest of them in addition to sepsis had ARDS. They received a broad spectrum of antibiotics and developed fungal infections and grew multidrug resistant bacteria in blood cultures due to prolonged intubation and ICU care. Most of the neonates except one were covid negative.

#### **IV. Discussion**

Pregnant patients with comorbidities like Diabetes, obesity, hypertension, asthmatics could be at increased risk for severe illness consistent with the general population with similar comorbidities. The most common symptoms at presentation were fever, myalgia, shortness of breath, cough, diarrhea. Most of the cesareans were in maternal interest to improve the respiratory function after a multidisciplinary consensus. There is no evidence of vertical transmission. Increase in preterm deliveries led to an increase in the cost burden. Due to prolonged SCBU occupancy. It is getting increasingly evident the high risk of venous and arterial thromboembolism in patients diagnosed with COVID-19 due to excessive inflammation, hypoxia, immobilization and diffuse intravascular coagulation. A Dutch study of 184 patients with COVID-19 pneumonia found that 31% had venous or arterial thromboembolism (acute pulmonary embolism, ischemic stroke, deep vein thrombosis or myocardial infarction).<sup>37</sup> All our mild cases received thromboprophylaxis and therapeutic doses in moderate to severe covid in accordance to RCOG guidelines with none of the above complications.

This novel disease is under constant evolution and guidelines are changing periodically. Meanwhile we need to strive to ensure all women have access to safe maternity services. Being updated with the evidence for the treatment of COVID-19 in the pregnant population and follow strict infection control measures to decrease the spread of disease within our own units.

#### **V. Conclusion**

A constant revision of the protocol for management of covid in pregnancy by communication and sharing of international experiences especially in terms of pharmacology and pathophysiology was the key factor in preventing morbidity and mortality. Clinical vigilance and knowledge of symptomatology, signs and laboratory findings which could differentiate and identify mild, moderate and severe pneumonia helped in tailored management of these pregnant women. A pragmatic and holistic multi-disciplinary approach and a collective scientific effort is required to mitigate the various safety impacts of this crisis whose implications reach far beyond the bio-medical risks

Lack of uptake of vaccination by the local community and emergence of resistant strains of the virus lead to emergence of critical cases in whom mortality could not be avoided

Stricter infection control measures, periodic fumigation of the wards and taking swabs from different area in the facility can prevent nosocomial infections which could have added to the cause of mortality in our patients.

Community education through social media helped in increasing the uptake of covid vaccination and using of masks and hand hygiene and social distancing in the local community

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