RESEARCH ARTICLE

Barriers to antenatal care during COVID-19 pandemic: A hospital-based retrospective cross-sectional study in rural south Karnataka

Philomena Zacharias, Merlyn Joseph, Ann Jacob, Mary Viji CL, Nitisha Ann Josy, Shulia Lydia, Avita Rose Johnson

Corresponding author: Dr. Avita Rose Johnson, Department of Community Health, St. John's Medical College, Sarjapur Road, John Nagar, Bangalore, India; Email : avita@johnson.in

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ABSTRACT

Background: As part of Covid-19 pandemic response, India went into lockdown to reduce transmission and prevent overwhelming of hospitals. Pregnant women need protection from Covid-19, while ensuring they receive antenatal care (ANC). **Objectives:** To assess barriers to ANC during Covid-19 pandemic lockdown in rural south Karnataka. **Methods:** Hospital-based, retrospective cross-sectional study among pregnant women availing ANC in June-July 2020, using a pre-tested interview schedule to capture barriers of access and fears during the pandemic lockdown of 22 March to 31 May 2020. Chi-square test performed to associate barriers to ANC with various independent co-variables. **Results:** Of 144 pregnant women, 61.8% reported at least one barrier to accessing ANC, 38.9% reported at least one fear and 85% were not able to access ultrasounds and blood tests. Barriers were lack of income, lack of transportation and hospitals /diagnostic centres remaining closed. Barriers of fear were: getting infected with Covid-19, fear of not receiving proper treatment, fear of being turned away from hospital and fear of isolation from family. Women of lower socio-economic class and with pre-existing pregnancy complications were significantly more likely to experience barriers to ANC. **Conclusion:** Our study found that those residing in rural areas faced barriers to ANC as a result of a well-intentioned pandemic response. Community-based strategies, mechanisms for referral, health education and counselling through village-level workers may help to overcome these barriers. Policy makers must prioritize needs of pregnant women and address these barriers to ensure continued accessibility to ANC during any future pandemics.

Keywords: Covid-19, antenatal care, barriers of access, fears, pregnant women.

The spread of SARS-CoV-2 virus, causing Corona virus disease (Covid-19) was declared a global pandemic by World Health Organization on 11th March 2020.¹ India has crossed 4.4 million confirmed Covid-19 cases since the pandemic began,² reaching third highest number of Covid-19 cases world-wide³ along with nearly 75,000 Covid-19-related deaths.¹ With rising number of cases, the population at risk of transmission includes those regularly visiting hospitals such as pregnant women. In order to reduce transmission, flatten the pandemic curve and prevent overwhelming of the health system, India went into a nation-

wide lockdown from 22nd March to 31st May 2020.⁴ While essential services were functioning and hospitals used this time to procure equipment and ramp-up infrastructure,⁵ non-Covid-19 patients, including pregnant women, faced difficulties in accessing care during this period.⁶

India has the largest number of pregnant women in the world and 20 million babies are projected to be born between March and December 2020.⁷ Hence, the huge challenge to protect pregnant women from being infected with Covid-19, while ensuring they still receive adequate antenatal care (ANC). Essential ANC includes early registration of

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pregnancy, monthly ANC visits, daily iron and folic acid (IFA) and calcium supplementation, screening and referral of high risk mothers and birth preparedness⁸. There is paucity of published literature to assess if these evidence-based measures to reduce maternal and perinatal mortality were compromised during Covid-19 pandemic lockdown. Documenting barriers faced by pregnant women in accessing essential ANC will enable us to strategize for preparedness in future pandemics, which would ensure essential ANC and prevent adverse maternal and perinatal outcomes. Two thirds of our population reside in rural areas, and therefore, this study was conducted in a rural area, to assess barriers faced by pregnant women to accessing ANC during Covid-19 pandemic lockdown. The data from this study will enable policy makers to design targeted interventions addressing these barriers, not only in the on-going Covid-19 pandemic, but also in preparedness for future pandemics.

Methods

A retrospective cross-sectional study was conducted at a secondary level maternity hospital in a village in Ramnagara District, Karnataka, located 60 Kms from Bangalore city from June to July 2020. Study Population: Pregnant women attending antenatal clinic at the hospital. Sampling: In the absence of previous published literature, we assumed 50% of participants would encounter at least one barrier to ANC during lockdown. With 95% confidence level, 10% absolute precision and assuming 20% non-response rate, we calculated sample size to be 116. However, as data was collected by several researchers simultaneously, estimated sample size was exceeded. Consecutive sampling technique was employed.

Inclusion criteria: Antenatal women who were pregnant prior to 22nd March 2020, when the nation-wide Covid-19 lockdown began. Exclusion criteria: Those with labour pains, seriously ill or with mental health conditions that prevented them from understanding and responding to questions.

A pre-tested, face-validated, structured interview-schedule, translated in Kannada, consisting of three parts: i) socio-demographic and obstetric details, including Modified BG Prasad's Socio-economic classification.⁹ Complications in pregnancy were noted down from ANC records. ii) utilisation of essential ANC services during lockdown (22nd March to 31st May 2020) iii) barriers to essential ANC during lockdown, identified from extensive review of literature of barriers to care, consisting of two domains: barriers to access (8 items) and barriers of fear (8 items).

Outcome variables: Barrier to access (presence of any one barrier to access) and barrier of fear (presence of any one barrier of fear). Approval from Institutional Ethics Committee obtained. Written informed consent taken from all participants prior to administering the study instrument.

Statistical Analysis: Data was analysed using IBM Statistical Package for Social Sciences version 20. Study variables were described as frequencies, proportions, mean, standard deviation, median and interquartile range, as applicable. Outcome variables were associated with independent co-variables using Chi-square test. Data are presented as tables and graphs. P value of < 0.05 was considered as statistically significant for all analyses.

Results

A total of 144 pregnant women participated in the study, with mean age of 24.0±3.5 years. Mean number of years of formal education was 12.7±2.5. Majority (91%) were homemakers, Hindu by religion (93%) and studied at pre-university or higher. 56.9% were rural dwelling, with 43.1% from the near-by town. Most were from joint family (80.6%), with median monthly per capita income of INR 3,333 (2500, 5000) Rs.

Figure 1: Complications in pregnancy before and after lockdown among women in the second and third trimesters (N=133)

Most 108(75%) were in third trimester of pregnancy, 31(21.5%) in second and 5(3.5%) in first. All subjects were pregnant when the lockdown began. Most were primigravidae (62%). Bad obstetric history (previous abortions/stillbirths/infant deaths) was reported by 28(19.4%). Complications in pregnancy before and after lockdown among women in second and third trimesters were

Table 1: Association of barriers of access to ANC and barriers of fear with various independent covariates (N=144)

Variables	Category	Total N (%)	Barrier of access		P value	Barriers of fear		P value
			At least one barrier 89 (61.8)	No Barriers 55 (38.2)		At least one barrier 56 (38.9)	No Barriers 88 (61.1)	
Age in years	18-24	82(56.9)	50 (61.0)	32 (39.0)	0.814	35 (42.7)	47 (57.3)	0.283
	≥25	62(43.1)	39 (62.9)	23 (37.1)		21 (33.9)	41 (66.1)	
Education	Up to High School	38(26.4)	23 (60.5)	15 (39.5)	0.850	11 (28.9)	27 (71.1)	0.143
	≥ Pre-university	106(73.6)	66 (62.3)	40 (37.7)		45 (42.5)	61 (57.5)	
Type of family	Nuclear	28 (19.4)	20 (71.4)	8 (28.6)	0.243	13 (46.4)	15 (53.6)	0.362
	Joint	116 (80.6)	69 (59.5)	47 (40.5)		43 (37.1)	73 (62.9)	
Socio-economic status	Upper/ upper middle	58(40.3)	24 (41.4)	34 (58.6)	0.624	28 (48.3)	30 (51.7)	0.020*
	Middle	57 (39.6)	19 (33.3)	38 (66.7)		42 (73.7)	15 (26.3)	
	Lower middle/ lower	29 (20.1)	12 (41.4)	17 (58.6)		18 (62.1)	11 (37.9)	
Place of residence	Village	82(56.9)	57 (69.5)	25 (30.5)	0.028*	38 (46.3)	44 (53.7)	0.034*
	Town	62(43.1)	32 (51.6)	30 (48.4)		18 (29.0)	44 (71.0)	
Bad obstetric history	Yes	116(80.6)	71 (61.2)	45 (38.8)	0.763	44 (37.9)	72 (62.1)	0.631
	No	28(19.4)	18 (64.3)	10 (35.7)		12 (42.9)	16 (57.1)	
Pregnancy complications	Yes	36(25.0)	26 (61.8)	10 (27.8)	0.137	19 (52.8)	17 (47.2)	0.048*
	No	108(75.0)	63 (58.3)	45 (41.7)		37 (34.3)	71 (65.7)	

*Statistically significant at P<0.05, All the numbers in parentheses are row totals except in the 'Total' column where they are column totals.

compared. While proportion of oligo/ polyhydramnios increased during lockdown from 3% to 9%, number of pregnancy-induced hypertension (PIH) and anaemia decreased during lockdown (figure 1).

Figure 2: Inability to access essential ANC during lockdown (N=144)

Most pregnant women in our study reported not being able to access blood tests or ultrasounds (85%) during lockdown, 12% could not get their blood pressure and weight checked. Nearly all (97%) continued to have access to iron and calcium supplementation. None had access to any telemedicine services.

Commonest barriers faced by pregnant women to accessing ANC during Covid-19 pandemic lockdown were: lack of income (45%), lack of availability of cash / access to ATM (40%), usual hospital being closed (14%), lack of a vehicle for transportation (12%), lack of family support to go for ANC (12%) and laboratories being closed (11%) (figure 2). Nearly two thirds (61.8%) reported at least one barrier to accessing ANC. Barriers to access was significantly associated with living in the nearby town (table 1).

Participants also reported various fears, which prevented them from accessing ANC during the lockdown: fear of getting infected with Covid-19 (34%), fear of not receiving

Figure 3: Barriers of access to ANC faced by pregnant women during the Covid-19 pandemic lockdown (N=144)

Figure 4: Barriers of fears affecting ANC as reported by pregnant women during the Covid-19 pandemic lockdown (N=144). proper treatment (15%), fear of getting admitted with Covid-19, fear of being turned away from the hospital (13%) and fear of isolation from family (10%) (figure 3). More than one-third (38.9%) of our study subjects reported at least one

fear that was a barrier to accessing ANC. Barrier of fear was significantly associated with low socio-economic status ($P=0.02$), town-dwelling women ($P=0.001$) and those with known pregnancy complications prior to lockdown ($P=0.048$) (table 1).

Discussion

A key component of pandemic preparedness involves addressing needs of pregnant women, who face a unique conundrum, whether to seek regular ANC and risk getting infected, or stay away from the health system and risk developing complications.

Our study reported several barriers to ANC during the Covid -19 pandemic lockdown. The biggest fear among pregnant rural women in our study was the fear of getting infected with Covid -19. Pregnant women in urban areas too have reported a fear of contracting the virus during visits to hospital for ANC.¹⁰ This is a justified fear, as it has been found that pregnant women are more likely to suffer complications of Covid -19. A recent report from the US Centers for Disease Control and Prevention (CDC), found 31.5% of pregnant women with Covid -19 were reported to have been hospitalized compared to just 5.8% of nonpregnant women. Pregnant women were more likely to be admitted to the ICU [aRR=1.5(1.2–1.8)] and receive mechanical ventilation [aRR=1.7(1.2–2.4)] for Covid -19 complications.¹¹

Pregnant women in metropolitan cities have been instructed by obstetricians to monitor blood pressure, blood sugar and baby movements at home and use telemedicine (teleconsultation) services.¹⁰ However, in our study setting, none had access to any teleconsultation. Lack of access to digital devices and wifi/internet can be additional barriers for women in rural communities. Common pandemic preparedness strategies to reduce transmission may seem outwardly fair and neutral, but create disparities when applied in unequal socio-cultural contexts like urban /rural, rich/poor or digitally-savvy/illiterate. Therefore, social-distancing strategies such as tele-consultation for avoidance of hospitals may not be a realistic option for rural pregnant women.

Subjects in our study reported not being able to access blood tests or ultrasounds during lockdown. Though numbers were small, we found that the proportion of oligohydramnios and polyhydramnios increased during lockdown. This could be attributed to lack of early detection via ultrasounds. Inability to access ultrasounds has been similarly reported by pregnant women during lockdown in

other states of India as well as other countries across the globe.^{12, 13} While healthcare providers felt obligated to postpone ultrasounds to avoid risk of infection to pregnant women, the fact remains that adverse conditions may remain undiagnosed.¹⁴ Also, anomaly scans typically carried out between 18 to 22 weeks of gestation, is a narrow window of opportunity that may have been missed out. Access to essential components of ANC like blood pressure and weight measurement was also hampered during lockdown. These points out that healthcare facilities need to develop strategies to ensure that pregnant women receive essential ANC, but with minimal exposure to Covid-positive cases. In addition, plans for care and delivery of pregnant women with confirmed Covid-19 must ensure that these women receive appropriate care without exposing other healthy pregnant women to risk of infection.

Surprisingly the numbers of pregnancy-induced hypertension (PIH) and anaemia slightly reduced during lockdown. Though this number was too small to draw definite conclusions, we can attribute this to families being together at home, giving pregnant women additional emotional support and help, which may have reduced stress and household chores, thereby decreasing blood pressure. Nearly all women in our study reported being adherent to iron supplementation during lockdown. Though our study design did not allow for further exploration qualitatively, we surmise that family support during lockdown could have also contributed to adherence and thereby decreased anaemia.

Outbreaks of infectious disease tend to highlight barriers to healthcare ranging from lack of access due to geographic distance, to high costs which dissuade individuals from seeking care. These barriers disproportionately affect those who are already vulnerable including rural and low income individuals. The commonest barriers to accessing ANC during lockdown faced by pregnant women in our study were: lack of income, lack of availability of cash / access to an ATM and lack of transportation. Women residing in the nearby town faced transportation barriers due to strict measures that prevented easy movement of vehicles. Women from low socio-economic class were also found to face barriers to ANC. The Minnesota Pandemic Ethics Project (MPEP) also identified similar access barriers in communities in USA: lack of transportation and distance to care,¹⁵ with financial burden of healthcare cited as a challenge for those without private or public insurance. In our study too, lack of income during the pandemic was an issue, considering that in our rural study setting, those engaged in agrarian

occupations are mostly daily wage earners. This indicates that it is necessary while planning for pandemic preparedness to ensure that social and financial factors do not interfere with the ability to receive healthcare.¹⁶ Preventive strategies during pandemics may exacerbate risks for vulnerable populations like lower-income rural women who need ANC the most, but also face the most barriers to ANC. Rather than ameliorating structural inequalities, pandemic preparedness strategies sometimes contribute to them.¹⁵

The rural women in our study reported various fears, which acted as barriers to accessing ANC during the lockdown: fear of getting infected with Covid-19, fear of not receiving proper treatment, fear of being turned away from hospital and fear of isolation from family. These fears were significantly associated with residing in the near-by town, as compared to villages. This may have been because communities residing in towns have more access to information, forwarded messages on smart phones, access to TV and media reporting on Covid-19 which may have played a role in increasing apprehensions and fears, along with rising number of cases in the urban area. Women with known pregnancy complications prior to lockdown were also significantly more likely to have barriers of fears, probably due to apprehensions of not being able to access care in case of emergency and worries of worsening of complications or adverse outcomes. Fears during pandemics may exacerbate the usual level of stress and anxiety that is experienced in pregnancies.¹⁷ This reveals a need for support mechanisms and counselling services to alleviate unnecessary stress on the mother.

Though our study found that lock-down measures during the Covid-19 pandemic did not create insurmountable barriers to access, our findings are still aligned with reports from developed countries, that show that socially disadvantaged rural populations can become more burdened by public health response interventions than relatively privileged populations. A pragmatic social justice approach, addressing both health disparities and access barriers, should influence pandemic preparedness.^[18] Community support in the form of women's groups, along with referral and counselling through mechanisms involving village-level workers, can help overcome barriers of fear. Policy makers need to counter the social injustice of structural inequalities and adequately meet needs of vulnerable groups, therefore pandemic preparedness efforts must address both health disparities and access barriers. Side-lining maternal health in

the wake of Covid-19 may give rise to a parallel health disaster. In a crisis situation such as now, meticulous planning, focussing on availability and accessibility of essential ANC is of utmost importance to prevent adverse maternal and perinatal outcomes.

The study design being hospital-based, we could not capture data from women in the community, who might still be facing barriers to ANC even in the 'unlock phase'. As this was a retrospective study with questions pertained to events that occurred a month or two prior, there might have been possibility of recall bias. The lack of qualitative methodology also prevented us from exploring further into issues of fears and barriers to accessing ANC.

Conclusion

Our study identified several barriers to accessing ANC during the Covid-19 pandemic lockdown such as lack of income, lack of transportation and hospitals /diagnostic centres being closed. Barriers of fear which hindered ANC were fear of getting infected with Covid-19, fear of not receiving proper treatment, fear of being turned away from the hospital and fear of isolation from family. Women residing in the town, of lower socio-economic class, and those with pre-existing pregnancy complications were significantly more likely to experience barriers to ANC.

Conflict of interest: None. **Disclaimer:** Nil.

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Philomena Zacharias¹, Merlyn Joseph², Ann Jacob³, Mary Viji CL⁴, Nitisha Ann Josy⁵, Shulia Lydia⁶, Avita Rose Johnson⁷

¹ Postgraduate student, Department of Community Health, St. John's Medical College, Bangalore, Karnataka, India; ² Tutor, Department of Community Health, St. John's Medical College, Bangalore, Karnataka, India; ³ Intern, Department of Community Health, St. John's Medical College, Bangalore, Karnataka, India; ⁴ Intern, Department of Community Health, St. John's Medical College, Bangalore, Karnataka, India; ⁵ Intern, Department of Community Health, St. John's Medical College, Bangalore, Karnataka, India; ⁶ Intern, Department of Community Health, St. John's Medical College, Bangalore, Karnataka, India; ⁷ Department of Community Health, St. John's Medical College, Bangalore, Karnataka, India.