

Pregnancy and Newborn Related Complications: Implication of COVID-19 Pandemic on the Reduction of Antenatal Care in Bangladesh

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Abstract:- Antenatal care (ANC) has long been considered a very crucial component of the successive care of a pregnant mother during gestation. It reduces the risk of both maternal and neonatal complications and gives assurance to a healthy beginning for the infant. The ANC situation of Bangladesh is quite poor comparing that of the developed nations. The scenario has been further worsened due to the outbreak of the COVID-19 pandemic. In Bangladesh, the number of ANC contacts has been reduced by 20-25% in this pandemic situation. There is a lot of research evidence about the relationship between an increased rate of maternal and child mortality and a reduced number of ANC contacts. Besides, the quality of ANC is not up to the mark in Bangladesh. Since the status of a country's future generation comprehensively depends on the obstetric population, no compromise should be allowed regarding ANC even in this COVID-19 pandemic. The obstetric population must need special and distinctive considerations in such a pandemic situation because of their diacritic physiological and psychological needs. An efficient and collaborative strategic approach must be taken by obstetric care providing facilities and the government to mitigate the adverse effects of decreased ANC contacts. Such a strategic approach may include enhancing health communication, strengthening the community-based ANC, increasing the collaboration between primary healthcare services and ANC services, provision of telemedicine, mobilizing social resources, etc. COVID-19 has shown the shaky structure of the healthcare system of Bangladesh once again. So, a potential reformation in the healthcare system is highly needed.

Keywords:- Antenatal Care, COVID-19, Healthcare System, Maternal Health, Child Mortality.

I. INTRODUCTION

Antenatal care (ANC) the care delivered by skilled healthcare providers to pregnant women to ensure the optimum health conditions for both mother and newborn during gestation. ANC covers the time started from conception till successful parturition. According to the WHO, there are three components of ANC: a) risk identification; b) prevention and management of pregnancy-related or concurrent diseases; c) health education and health promotion (World Health Organization [WHO], 2016). The main

purpose of ANC is to reduce the risk of any sort of health complications of both mother and fetus and to ensure a healthy beginning for the newborn (Banta, 2003).

An efficacious ANC can be achieved through ANC contacts. ANC contacts refer to the routine check-up of pregnant women by health care professionals. So that health care providers can suggest treatment or medication if there are any kind of complications. Moreover, they can provide basic knowledge about pregnancy to women. If a mother keeps proper knowledge collaborating with skilled health care personnel, she will be able to understand whether she is at risk or not. Besides, she will be informed of how to prevent diseases or health risks associated with pregnancy. On the other hand, it will let her know the condition of the fetus and learn about crucial pregnancy-related information. Consequently, health care providers can take the necessary steps or advise mothers if any complications occur (Banta, 2003; WHO, 2016). But current COVID-19 pandemic has woefully affected ANC like all other aspects.

The novel human coronavirus disease (COVID-19) was first identified and reported in Wuhan, the capital of Hubei Province in the People's Republic of China (Velavan & Meyer, 2020). Gradually, this disease spread throughout the globe and the WHO declared it a global pandemic (WHO, n.d.). Considering phylogenetic analysis, the International Committee on Taxonomy of Viruses officially named the virus acute respiratory syndrome coronavirus 2 (SARS-CoV-2) (Gorbalenya et al., 2020). As this disease follows mainly human-to-human transmission, most of the countries have called for either lockdown or strict social distancing. Along with preventive measures like lockdown, social distancing, etc., scientists of many countries have been working hard to develop an effective vaccine against SARS-CoV-2. There are a number of vaccines developed in the meantime and most of them are under trial (Craven, 2020). Very recently, the UK has approved the Pfizer/BioNTech coronavirus vaccine on December 2, 2020, being the first country to approve any vaccine against SARS-CoV-2. This epoch-making decision may pave the way for mass vaccination (Roberts, 2020). Until mass vaccination, nothing but preventive measures have to be carried out. This lockdown and social or physical distancing can have a latent potential to demotivate pregnant women, especially in developing countries like Bangladesh to schedule ANC contacts.

ANC has the potential ability to minimize the risk of both maternal and child mortality and morbidity. It also ensures positive maternal and neonatal outcomes. (Banta, 2003; WHO, 2016). Many studies have found that ANC is effective to diminish maternal mortality and morbidity (Bloom et al., 1999, Carroli et al.; 2001; Prual et al., 2000). Multiple studies have indicated a positive association between increased ANC contact and reduced probabilities of neonatal death (Kuhnt & Vollmer, 2017; Pervin et al. 2012; Roy & Haque, 2018; Tekelab et al., 2019; Wondemagegn et al., 2018). A study conducted in Bangladesh found that women who had proper ANC experienced 18% lower odds of early neonatal mortality than women who did not have ANC (Roy & Haque, 2018). Another study revealed that women having less than or equal to one ANC contact faced two times more perinatal mortality than women having more than three ANC contacts (Pervin et al., 2012). At least one ANC contact provided by a proficient health service provider can decrease neonatal death by 39% in the sub-Saharan African countries (Tekelab et al., 2019). A cohort study conducted in rural Bangladesh discovered an association between decreased cases of preterm births and an increased number of ANC contacts (Pervin et al., 2020).

Because of such vitality of ANC, WHO recommends at least eight ANC contacts (previously a minimum of four ANC contacts) throughout gestation in order to reduce perinatal mortality and enhance the mother's experience of care. The terms 'ANC contact' and 'ANC visit' are identical. The term 'ANC visit' is still used vastly because this term was used in every previous WHO recommendations. But now, in the latest recommendation, the WHO experts prefer the word 'contact' to 'visit' as it connotes an active connection between pregnant women and health service providers. (WHO, 2016).

Based on experimental pieces of evidence, it is confirmed that ANC contacts should be followed mandatorily. But in today's COVID-19 pandemic situation, we notice a sudden decrease in practicing ANC contacts. The ostensible complications seem to be quite alarming. This article will try to find the impact of the COVID-19 pandemic on the reduction in ANC and also find some possible ways which can enhance the chance of achieving a quality ANC in such a pandemic situation. follow.

II. ANTENATAL CARE SITUATION IN BANGLADESH

Table 1 shows the number of ANC contacts and the percentage of women (age 15-49) fallen in each class of ANC contacts, according to Bangladesh Health and Demographic Survey 2007, 2011, 2014, 2017-18 (National Institute of Population Research and Training [NIPORT], 2009, 2013, 2016, 2019a). It is noticeable that the percentage of women who have had four or more ANC contacts has increased by a great extent in 2017-18. The percentages of women who have had four or more ANC contacts in 2007 and 2017-18 are 21% and 47% respectively. Even so about half of the women have had less than three ANC contacts. The percentage of women who have had no ANC contacts at

all has decreased in 2017-18. This percentage was 40% in 2007 and in 2017-18, it has become 8%.

Bangladesh Multiple Indicator Cluster Survey 2019 (MICS 2019) reported that the percentages of women (age 15-49) who have had ANC contacts at least one time by skilled health personnel, at least four times by any provider, at least eight times by any provider are 75.2, 36.9 and 4.9 respectively (Bangladesh Bureau of Statistics [BBS], 2019).

Table 1: Coverage of Antenatal Care Contacts (2007-2018)

Number of ANC visits	BDHS 2007	BDHS 2011	BDHS 2014	BDHS 2017-18
None	39.6	32.1	21.4	8.0
1	15.8	15.3	17.9	13.1
2	13.0	14.4	16.2	16.4
3	10.9	12.5	13.2	15.5
4 or more	20.6	25.5	31.2	47.0

According to the BDHS 2017-18 definition of quality ANC, only 18% of women were able to receive quality ANC. It means four out of every five mothers of Bangladesh lack quality ANC. The indicators of quality ANC comprises receiving four or more ANC contacts, of which at least one is from a medically trained health personnel and having basic services of ANC, including measurements of weight, blood pressure, blood and urine tests, and information on signs of possible maternal and fetal complications (NIPORT, 2019a).

There are some determining factors regarding the quality and frequency of ANC in Bangladesh. Several types of research have been conducted to identify the factors and to measure to what extent they are associated with ANC. Urban women are more likely to have quality ANC than rural women. It is found that urban women are more concerned about ANC and have more accessibility towards ANC than rural women (Ali et al., 2018; Jahan & Jahan, 2016). Maternal education plays a vital role in receiving ANC. The more educated a woman, the more she is likely to get proper ANC. Uneducated or less educated mothers are not aware of having enough ANC (Ali et al., 2018; Jahan & Jahan, 2016). A study showed that women empowerment is also associated with the utilization of ANC after measuring the education level and participation of women in decision making. Educated mothers who participate in the decision-making of family affairs are more amenable to achieve complete ANC than uneducated, less educated, and genuflected women (Hossain & Hoque, 2015). Women who earn money are more likely to have quality ANC than typical housewives (Chakraborty et al., 2003). Husband's education is also related to ANC. An educated and conscious husband is always aware of his wife's healthcare (Ali et al., 2018). Husband's occupation also determines the quality and frequency of ANC. A study revealed that service holders and businessmen are more conscious about their wives' care than that of farmers and day laborers (Chakraborty et al., 2003). The high socio-economic status of the family is positively associated with an increased ANC (Ali et al., 2018; Shajahan et al., 2013; Islam & Masud, 2018). Exposure to mass media (e.g. television, newspapers, radio, etc.) is an important factor regarding ANC. Women having access to mass media are

more prone to schedule ANC contacts. But in rural Bangladesh, the proportion of women who have television or read newspapers regularly is very low (Ali et al., 2018; Shajahan et al., 2013). With the increase in the number of living children, mothers are demotivated to schedule ANC contacts (Shajahan et al., 2013). The above-cited studies show us that rural residence, illiteracy, and ignorance of both husbands and wives, poverty, less exposure to mass media, increased number of offspring, etc. are negatively associated with quality and complete ANC in Bangladesh.

III. COVID-19 PANDEMIC AND ANTENATAL CARE IN BANGLADESH

At the time of writing this article, there were a number of 68,165,877 confirmed cases of COVID-19 and 1,557,385 confirmed deaths recorded worldwide (WHO, n.d.). Bangladesh is a developing nation. This country is also facing the invasion of COVID-19 like the rest of the world. The Government of Bangladesh has to follow preventive techniques (e.g. lockdown, strict social distancing, etc.) to quell the spread of the virus until mass vaccination. The lockdown, described as general holiday by the government, continued from March 26 to May 31. Then some restrictions were eased for offices and public transports, and offices were reopened (Shawon, 2020). But the educational institutes are still under general holiday and remained closed. In Bangladesh, the first case of COVID-19 was reported on March 8, 2020. The number of daily COVID-19-detection tests was very low in the first six or seven weeks, then the number of tests was comparatively increased gradually. A total number of 485,965 people had been affected and 6,967 had died by December 10, 2020, in Bangladesh (Ministry of Health and Family Welfare, n.d.). The number of tests is still very low compared to other countries, so it is questionable whether the confirmed cases represent the actual situation.

Antenatal care, an indispensable matter for every pregnant woman, is going through a drastic change in the COVID-19 situation in Bangladesh. Not a great number of evidence data are available but several newspaper reports (Maswood, 2020) and research briefs (Ainul et al., 2020) from nongovernmental research organizations confirmed maternal healthcare disruptions in this pandemic. According to the research brief of the Population Council (Ainul et al., 2020), antenatal care (ANC), postnatal care (PNC) and delivery services are facing considerable declines. The number of ANC visits in June 2020 and July 2020 was 20-25% lower than that of June 2019 and July 2019. Similar trends followed for PNC. All types of institutional delivery services—normal delivery, active management of the third stage of labor (AMTSL), and caesarian section were 10-15% lower in June 2020 and July 2020 than that in 2019. A rapid needs assessment conducted by CARE International found that 71% of the pregnant respondents had missed their regular ANC check-ups due to the unavailability of healthcare services and local transportation (CARE International, 2020). Director for Maternal and Child Health of Directorate General of Family Planning confessed to a newspaper that COVID-19 had brutally shattered the maternal health care. They were also afraid of a surge in the maternal mortality rate (Maswood,

2020). These findings carry evidence that how robustly COVID-19 has affected the maternal healthcare services of Bangladesh. A modelling study estimated that low- and middle-income countries might face an additional 60% maternal deaths and 41% child deaths in the COVID-19 pandemic due to potential obstruction in health systems and reduced access to food (Robertson et al., 2020). Bangladesh is not out of this scenario.

It can be assumed that expecting mothers are reluctant to schedule ANC contacts in this pandemic situation because of the fear of being affected by SARS-CoV-2. The first-ever reported study of the United Kingdom about pregnant women's perceptions of COVID-19 found that a significant number of pregnant women were in fear of being affected by the virus and they thought that the disease could be transmitted to their baby (Karavadra et al., 2020). On the other hand, the magnitude of the pandemic is now trending all over the mass media. Moreover, there is a great number of people who can be COVID-19 positive but show no symptoms. Many studies have been published regarding this phenomenon (Bai et al., 2020; Mizumoto et al., 2020). A Japan-based study found 18% of the COVID-19 patients were asymptomatic (Mizumoto et al., 2020). These reasons legitimate the fear of pregnant women about COVID-19. Significant financial constraints are seen in families which principally depend on daily wage-earning due to lockdown condition. A newspaper report mentioned that many head family-income earners have lost their jobs in this pandemic situation in Bangladesh (Nur, 2020). Not only males, but also many females who used to work in garments factories, or as housemaids, lost their job due to COVID-19. An article from Maternal Health Task Force (Harvard Chan School Center of Excellence in Maternal and Child Health) Blog confirmed that most of the low- and middle-income countries do not have the capability to provide monetary relief to needy citizens. The stay-at-home situation, that is why, is like a curse for many poor and underprivileged (Kotlar, 2020). Therefore, it can be said that because of the COVID-19 pandemic, newly impoverished families have emerged, and poor families have become poorer. For this reason, many families nowadays cannot afford nutritious foods for mothers and children. Hence, maternal and child malnutrition is on the rise. Maternal malnutrition can lead to maternal death, stillbirth, neonatal death, preterm birth, low birth weight, etc. (Black et al., 2008; Jammeh et al., 2011; Singh et al., 2009). As described earlier, all types of institutional delivery services reduced during this pandemic. This reduction occurred due to the maladjustment between service providers and authorities along with emerging income reduction and poverty among service-recipients. To cut the extra burden of cost for transport and delivery, many women are willing to give birth at home with the help of unqualified traditional birth attendants. Postpartum hemorrhage (PPH) and eclampsia are responsible for 54% of maternal deaths in Bangladesh (NIPORT, 2019b). Thus, titular ANC and at-home delivery during COVID-19 can cause increased maternal and perinatal death in Bangladesh. As said beforehand, less ANC is associated with poverty. On the other hand, pregnant women of such low socioeconomic status cannot afford to get quality ANC provided by experienced, private practitioners due to poor economic conditions. So,

they are heavily dependent upon government facilities like Union Health and Family Welfare Center, Upazilla Health Complex, District Hospitals, Medical College Hospitals, etc. which provide cost-free or low-cost services. Though there are a lot of public health care facilities in both rural and urban areas of Bangladesh, the quality of their service is not up to the mark, very poor actually (Chowdhury et al., 2009; Mansur et al., 2014). The primary health care services have collapsed due to the lockdown and unwillingness of health care providers to provide service in this pandemic (Islam et al., 2020). For such reasons, poor women are likely to miss the privilege of getting cost-free or low-cost ANC services. Comparing the present condition with the dimension of access by Penchasky and Thomas (1981), it can be declared that low-quality health care resource settings combined with reduced accessibility due to lockdown can lead to a maternal health care catastrophe (Huq & Biswas, 2020). It was described beforehand that access to mass media (newspapers, televisions, etc.) is positively associated with ANC. Women's exposure to mass media has been very poor from the very past. It is not difficult to assume that this exposure is more reduced in such a pandemic situation when most of the underprivileged people have been just trying to get rid of starvation with their very limited resources. So, the ANC awareness programs on television, newspaper releases have not caught their eyes. Domestic violence is an important concern in this pandemic situation. Domestic violence has been existing for a long since and is likely to be increased due to work-from-home or stay-at-home situation. Child or women abusers nowadays mostly stay at home and this pushes the risk of increased abuse or violence (Evans et al., 2020). According to WHO, one of every three women is either sexually or physically abused. Intimate partner violence (IPV) is the most common among women (WHO, 2013). A rapid needs assessment conducted in Bangladesh by CARE International found that 35% of the participants had been physically abused by their husbands and all of them confirmed that psychological or mental pressure had increased in the lockdown (CARE International, 2020). A newspaper report suspected that domestic violence might increase in Bangladesh during the COVID-19 pandemic (Jahid, 2020). IPV is responsible for delayed ANC, deterioration of maternal mental health, preterm birth, low birth weight, small for gestational age, perinatal death, etc. (Alhusen et al., 2015; Huth-Bocks et al., 2002).

Royston et al (1989) found that 99% of the total maternal deaths across the globe occurred in less developed or developing countries. At present, the rate is 94% (WHO, 2019). The rate has not significantly changed from as it was in the late 1980s. Most of these deaths could be restrained. A quality ANC can play a vital role in preventing such deaths (Banta, 2003; WHO, 2016, 2019). During the Ebola virus epidemic, the number of women attending antenatal care reduced by 18% in Sierra Leone. 34% and 24% increase were observed in maternal mortality ratio and stillbirth rate respectively (Jones et al., 2016). In Bangladesh, the probability of death within the first month of life (neonatal mortality) is 26% (BBS, 2019). 13% of the total adult female deaths occur due to maternal causes. In Bangladesh, the maternal mortality ratio is 196 per 100,000 live births

(NIPORT, 2019b). These rates are quite high. If the ANC contacts are likely to diminish, there is a very strong possibility of increasing these rates. This can be alarming. Bangladesh has targeted to achieve a maternal mortality ratio of 70 per 100,000 live births and a neonatal mortality rate of 12 per 1,000 live births regarding Sustainable Development Goals (SDG)-Agenda 2030 (Government of the People's Republic of Bangladesh [GoB], n.d.). SDG Tracker, a government website regarding SDG achievement status, shows that in 2019 maternal mortality ratio was 165 per 100,000 live births and the neonatal mortality rate was about 16 per 1,000 live births and there was a reducing trend in these rates (GoB, n.d.). But COVID-19 has changed the whole scenario. Now it may be very difficult for developing countries like Bangladesh to achieve the SDG goals by the deadline.

Some effective strategies have to be identified in order to increase the extent and the quality of ANC during such pandemic situations. A probable efficient set of strategies is given below:

➤ *Enhancing Health Communications*

The government and non-government agencies can take necessary steps to build up awareness among women about the inevitability of ANC contacts even in such epidemic situations. Effective communication between mass people and healthcare authorities of the government can be established in several ways. The government can promulgate the effect of having and not having ANC through electronic (e.g., Radio, Television) and print media (e.g., Newspapers), cellular SMS, audio message through automated phone calls, etc. Social media can play an important role here because it has become a part and parcel of everyday life. Social media releases, videos, etc. containing pregnancy-related knowledge, more specifically ANC-related information, can be an effective low-resource strategy.

➤ *Strengthening Community-based Antenatal Care*

The government can set up necessary home visits by Family Welfare Visitors (FWV) with the help of non-governmental organizations (NGOs). These home visits should be cost-free, and this will help poor and unprivileged pregnant women. These home visits should give priority to rural areas, urban slum areas, poverty-ridden areas, and areas having most of the confirmed cases of the infected disease. This visit should include weight and blood pressure measurement along with a thorough check-up of complication sign-symptoms. Urine and blood samples can also be collected, and the report can be provided over SMS or cellular calling. The whole procedure should be performed by maintaining all sorts of health protocols (e.g., FWVs must wear Personal Protection Equipment). If such home visits are not feasible due to the shortage of healthcare personnel or the risk of transmission of the virus, another strategy can be followed. All the expecting mothers of a certain locality can congregate in a particular place maintaining physical distance and all other health protocols. One or two (according to necessity and availability) health service providers can give them advice about various aspects of pregnancy and maternal

care. Then the necessary check-ups of the pregnant mothers can be done one after another.

➤ *Modification in recommended routine ANC contacts that include in-person services (Zangmo et al., 2020)*

Instead of the latest WHO recommendation of eight ANC contacts, a minimum of four ANC contacts can be scheduled to reduce the contact with outside people, and exposure to the clinic or hospital environment. A study has found no disadvantage of having four ANC contacts rather than the latest recommendation of eight ANC contacts (Villar et al., 2001). But all kinds of tests, immunization should be done in between these contacts, rather than in different schedules. Unless there would be no use in reducing the number of ANC contacts.

➤ *Use of Telehealth, Telemedicine, and Virtual Healthcare*

The meaning and purpose of these terms are quite similar. These words are among the most used words in this epidemic situation. These technologies have paved the way for connecting the patients and health care providers without in-person contact and from long distance. Expecting mothers can have their ANC contacts, that do not comprise any in-person involvements like ultrasonography, biochemical laboratory tests, through telehealth. These telecommunication between health care providers and pregnant women can also act as a triage system. If a woman feels she needs to have a face-to-face appointment with health care personnel, telecommunication between her and an expert, experienced or reputable health service provider can decide whether she needs it or not. Thus, needless visits to clinics, hospitals, or any kind of health care centers can be diminished (Osanan et al., 2020; Zangmo et al., 2020).

➤ *Strengthening the Coordination between Primary Health Care Services and ANC Services*

Specialization is needed for pregnant mothers who come to the primary health care centers with the symptoms of COVID-19. Policies and strategies should be developed for solid coordination between primary health care services and ANC care. Isolation units can be prepared solely for COVID-19 suspected pregnant women in both primary health care centers and specialized ANC centers. Integrated ANC services in primary health care should be regarded to support the clinical, professional, organizational, system, and normative integration (Afrizal et al., 2020).

➤ *Mobilizing Social Resources and Policies*

Most of the people of low- and middle-income countries possess a limited amount of resources. COVID-19 has worsened the previous situation. The economic condition of poor people is very harsh as many of them have lost their job due to the pandemic. Day laborers, marginal farmers, small businessmen, low-grade private service holders are immensely victimized by the pandemic. Policies should be created for the welfare of these people. If they do not have adequate money or food, ANC is nothing but a luxury for them. Due to this sudden attack of paucity, low-income households lack peace and happiness. Thus, domestic violence aggravates, and such violence not only deteriorates the family integrity but also adversely affects society. That is

why mobilization of social resources matters so profoundly for the welfare of impoverished families. Policies should be developed regarding how the socio-economic status of impoverished people can be improved. It can be achieved either by providing monetary or food reliefs or creating employment opportunities for them.

➤ *Citizen response*

Solidarity network, tools for crowdfunding, innovative tech tools for skill-time matching ANC volunteering services can be introduced to the strategic approaches. Constructing solidarity networks with an aim to reinforce ANC services could prove to be beneficial. Spontaneous contribution from inhabitants might bolster the ANC infrastructures in a particular area. They might be able to assist both monetarily or with voluntary services. This way, even if support from governing authorities is inadequate, we might be able to achieve a sustainable ANC infrastructure.

Devising new strategies and tools for crowdfunding ANC services might be of great value. For voluntary services, a database may be created to record the availability and skills of those interested.

➤ *Transparency for health equity*

Mortality and morbidity numbers should be adequately documented for transparency. This will expose existing disparities in socio-economic and health systems disproportionately affecting certain communities and thus compounding the negative impact of the pandemic on ANC. As a result, response measures can be specifically aimed to address the unique needs of specific communities that will fill gaps in institutionalized services.

IV. CONCLUSIONS

COVID-19 has slowed down the pace of the whole world. This global epidemic has put a great impact on every corner of our lives. It is very difficult to find an aspect that is out of its claw. The whole healthcare system of this world is going through a reformation. In this reformation process, ANC contacts cannot be overlooked. Because ANC is equally important for the survival of both mother and baby. A good ANC can ensure a healthy and active future generation and a healthy and active generation can be turned into a productive asset for any country. We should try to find new ways regarding ANC as we cannot omit this essential care. Every hazard teaches us new lessons. This pandemic may be temporary, but these lessons will help us to combat other jeopardies in the future.

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