

Impact of COVID 19 on Human milk Banking in a tertiary care teaching hospital in Western Maharashtra, India.

Dr. Vaibhav Swami¹, Dr. Aarti Kinikar², Dr. Naresh Sonkawade³, Dr. Uma Y D⁴.

¹ (Third year Resident, Department of Pediatrics, BJGMC and Sassoon General Hospital, Pune.)

² (Professor and Head of the Department, Department of Pediatrics, BJGMC and Sassoon General Hospital, Pune.)

³ (Assistant Professor Department of Pediatrics, BJGMC and Sassoon General Hospital, Pune.)

⁴ (Second year Resident, Department of Pediatrics, BJGMC and Sassoon General Hospital, Pune.)

Abstract.

Background: As we all know along with general population, COVID 19 also affected pregnant women. According to recent data By CDC 1,00,472 cases has been reported among pregnant women for COVID 19 infection (dated July 12,2021). There is general consensus that breastfeeding should be encouraged because of its many maternal and infant benefits even during COVID 19 infection with strict precautions. Although the first priority for infants feeding is to encourage the use of breast milk when this is not possible, donated breast milk from Human milk Bank is second best option. Human milk Bank is functioning in BJ Government Medical College (BJGMC) and Sassoon General Hospital (SGH), Pune since November 19 in 2013 with an average milk collection of about 415 litres per year. Considering pandemic of COVID 19, in year 2020 this study is done to find out impact of COVID 19 on Human milk Bank collection

Material and Methods: Observational cross-sectional study was done after collecting data from medical record section of Human milk Bank unit. Data of number of deliveries, number of donors, number of total milk collection and number of beneficiaries was collected from month of April to October from Year 2019 and 2020 which was then compared after using statistical test (independent Sample T test).

Results: Average number of deliveries/month in year 2020 (686±66) was significantly lower than year 2019(917±26) ($p < 0.0001$). Average Number of donors/month in year 2020 (610±54) was significantly lower than year 2019. (885±162) ($p < 0.0001$). Average milk collection/month (in ml) in year 2020 (27723±6758) was significantly lower than year 2019 (65764±6378) ($p < 0.0001$). Average Number of beneficiaries/month in year 2020 (377±67) was significantly lower than year 2019. (572±50) ($p < 0.0001$)

Conclusion: COVID 19 pandemic has significantly affected Human milk Bank collection in year 2020.

Key words: Human milk banking, COVID 19 infection, infant feeding.

Date of Submission: 10-07-2021

Date of Acceptance: 26-07-2021

I. Introduction:

A novel coronavirus was isolated by Chinese authorities on January 7, 2020. (1) First case of COVID 19 in INDIA was reported on 30 January 2020 (2). Along with general population, it also affected pregnant women. According to recent data By Center for disease Control and Prevention 1,00,472 cases has been reported among pregnant women for COVID 19 infection (dated June 12,2021), (3). There is general consensus that breastfeeding should be encouraged because of its many maternal and infant benefits. In the setting of maternal COVID-19 infection, the infant may receive passive antibody protection from the virus since breast milk is a source of antibodies and other anti-infective factors, but mothers should perform hand hygiene before, and wear a mask during, breastfeeding (4). So, when precautions are taken, the course of new-born infection will be nonsevere if at all it occurs. This policy was based in part on a study from New York City that tested and followed 82 infants of 116 mothers who tested positive for SARS-CoV-2: no infant was positive for SARS-CoV-2 postnatally, although most roomed in with their mothers and were breastfed [5]. Recent published data on viral infectivity from samples of women with confirmed COVID-19 have confirmed that there is no evidence that SARS-CoV-2 can be transmitted via breastmilk (6), supporting epidemiological evidence that there is minimal evidence of breastfeeding being a route of vertical transmission (7). Although the first priority for infants feeding is to encourage the use of breast milk when this is not possible, donated breast milk from human milk bank is second best option. (1) New evidence regarding the stability of Sars-CoV-2 at different environmental conditions reported that the virus is significantly reduced when heated to 56°C for 10 minutes,

and within 30 minutes the virus is completely inactivated (6). All donor milk dispensed by Human milk Banks undergoes heat treatment using the Holder pasteurization method of 62.5°C for 30 minutes and hence it is safe to use. However, COVID 19 infection itself impacted human milk bank collection hence this study is to reveal impact of COVID 19 on Human milk Banking as milk banks are facing considerable challenges during the pandemic in maintaining the operation of services, alongside uncertainty in terms of which additional practices, if any, should be introduced into milk bank processes to maintain safety. Many of these challenges are related to external forces, such as from the impact of national pandemic responses impacting donor recruitment, availability of staff and logistics, lack of internationally agreed minimum standards and increased demand related to the pandemic, rather than safety challenges.

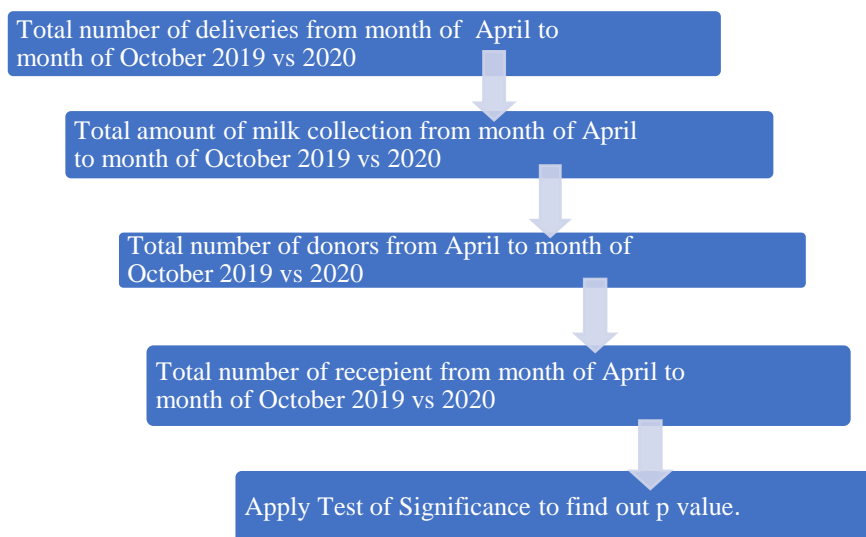
II. Materials And Methods:

Study Design: Observational cross-sectional study.

Study Location: This was a tertiary care teaching hospital-based study done in Department of Pediatrics at BJGMC and SGH, Pune, Maharashtra

Methodology: Observational cross-sectional study was done after collecting data from medical record section of Human milk Bank unit after getting permission from ethics committee. Data of number of deliveries, number of donors, number of total milk collection and number of beneficiaries is daily maintained in our milk bank as per WHO - IYCF (Infant and Young Child Feeding) guideline for HMB units. This data was collected from month of April to October from Year 2019 and Year 2020, which was then compared after using statistical test (independent Sample T test).

Following flow charts explains the study design.



III. Results :

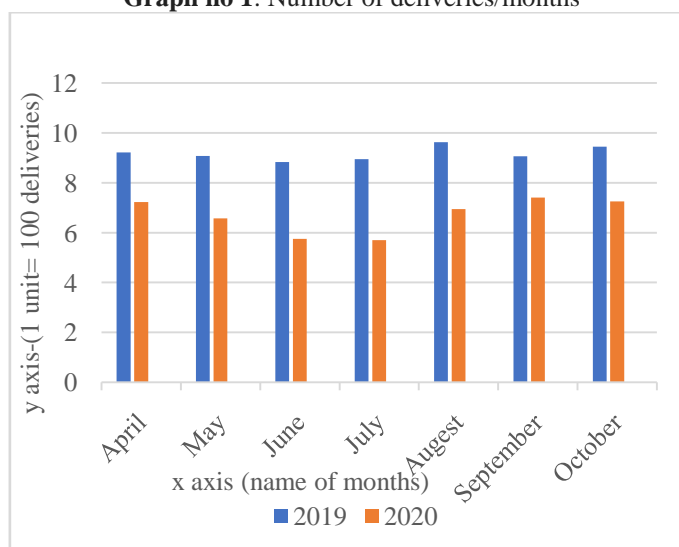
All data was collected and then entered in microsoft excel sheet and tabulated as given in table 1

Table no 1.

Parameters	Year 2019		Year 2020		p
	Mean	SD	Mean	SD	
No. of deliveries/month	917.1	25.9	685.6	67.6	< 0.0001
Total milk collection in ml/month	65764.4	6378.2	27722.7	6757.5	< 0.0001
Total No.of donors/month	885.1	161.6	610.0	54.0	0.0011
Total No. of beneficiary/month	572.0	49.9	377.0	67.1	< 0.0001

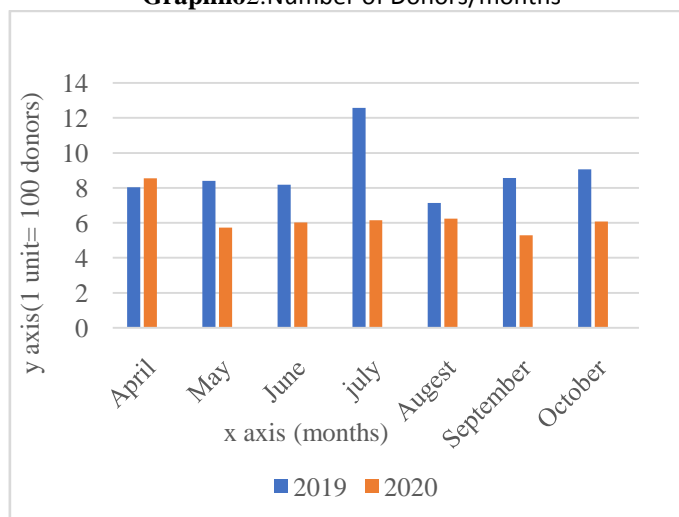
The data was put in graphs using bar diagram for year 2019 and 2020 separately.

Graph no 1: Number of deliveries/months



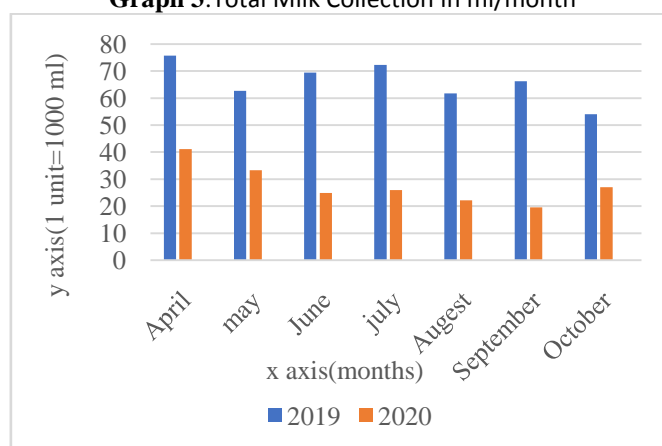
- Average Number of deliveries/month in year 2020 (686 ± 66) was significantly lower than year 2019. (917 ± 26) ($p < 0.0001$).

Graphno2: Number of Donors/months



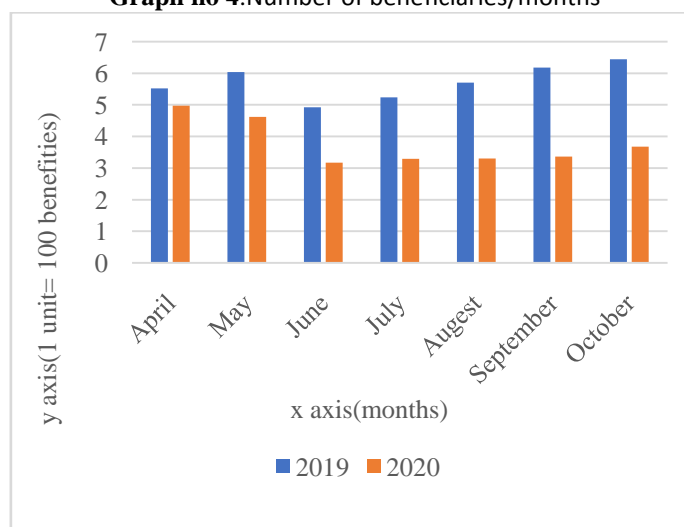
- Average Number of donors/month in year 2020 (610 ± 54) was significantly lower than year 2019. (885 ± 162) ($p < 0.0001$).

Graph 3: Total Milk Collection in ml/month



- Average milk collection/month (in ml) in year 2020 (27723 ± 6758) was significantly lower than year 2019 (65764 ± 6378) ($p < 0.0001$)

Graph no 4. Number of beneficiaries/months



- Average Number of beneficiaries/month in year 2020 (377 ± 67) was significantly lower than year 2019. (572 ± 50) ($p < 0.0001$).

After analysing the data, it was found that, for year 2019 average Number of deliveries/month were 917 ± 26 . Average Number of donors/month were 885 ± 162 . Average milk collection/month (in ml) was 65764 ± 6378 ml. Average Number of beneficiaries/month were 572 ± 50 . However, for year 2020, average Number of deliveries/months were 686 ± 66 . Average Number of donors/month were 610 ± 54 . Average milk collection/month (in ml) was 27723 ± 6758 ml. Average Number of beneficiaries/month were 377 ± 67 . There was significant difference between milk bank data of two years. Average Number of deliveries/month in year 2020 (686 ± 66) was significantly lower than year 2019. (917 ± 26) ($p < 0.0001$). Average Number of donors/month in year 2020 (610 ± 54) was significantly lower than year 2019 (885 ± 162) ($p < 0.0001$). Average milk collection/month (in ml) in year 2020 (27723 ± 6758) was significantly lower than year 2019 (65764 ± 6378) ($p < 0.0001$). Average Number of beneficiaries/month in year 2020 (377 ± 67) was significantly lower than year 2019 (572 ± 50) ($p < 0.0001$).

IV. Discussion:

The COVID-19 pandemic has brought additional considerations and challenges in field of neonatology, newborn nutrition and HMB operations. There is now strong evidence that the risk of SARS-CoV-2 vertical transmission through human milk is minimal (6,8). and milk bank procedures are effective at mitigating the theoretical risk of transmission (9,10,11). However, at the outset and in the absence of global standards or pan-national milk bank communication networks, individual milk banks and associations had to develop practices to ensure safety and continuity of their services. Here we present the research article on human milk bank collection affected during COVID 19 pandemic. When studied in terms of number of deliveries, number of donors and amount of milk collected in HMBs between year 2019 and year 2020 (non COVID Pandemic Year vs COVID Pandemic Year) from month of April to month of October we found that this pandemic had severely affected milk bank services.

There was significant difference between milk bank data of two years. Average Number of deliveries/month in year 2020 (686 ± 66) was significantly lower than year 2019 (917 ± 26) with significant p value ($p < 0.0001$). Average Number of donors/month in year 2020 (610 ± 54) was significantly lower than year 2019. (885 ± 162) with significant p value ($p < 0.0001$). And average milk collection/month (in ml) in year 2020 (27723 ± 6758) was significantly lower than year 2019 (65764 ± 6378) with significant p value ($p < 0.0001$). Average Number of beneficiaries/month in year 2020 (377 ± 67) was significantly lower than year 2019. (572 ± 50) ($p < 0.0001$). Several pandemic-related vulnerabilities in service provision were identified, including maintaining sufficient donors, transport logistics, safe handling, and contingency planning. In this assessment, we aimed to find out at what extent the milk bank services had been hampered in COVID pandemic as compared previous year when pandemic was not there. This study proved that COVID 19 pandemic had significantly affected milk bank services at our institute which indirectly affect neonatal intensive care.

V. Limitations:

Due to frequently changing standard management protocols of covid 19 during study period and strict isolation of covid positive mothers during study period, milk was not collected from COVID positive mothers. This might have affected Human milk Bank collection.

VI. Conclusion:

Milk banking services are highly vulnerable to new infectious pathogens. The COVID-19 response to prevent infection and reduce global spread must also ensure that inadvertent harm is not done to other critical aspects of care and prevention. HMBs around the world are facing unprecedented challenges to maintain safe human milk supplies in volatile health system infrastructures that limit routine operations. Many Human milk Bank systems have struggled to respond to the COVID-19 pandemic, with issues deepened by the lack of globally agreed safety guidelines and rapid communications for emergencies, as well as limited data and infrastructure to ensure responsiveness during a crisis. Additionally, policies designed to ensure safety between mother and infant during suspected or confirmed COVID-19 infection have been developed rapidly and often resulted in mixed messages and confusion. Strengthening of the HMB system is required to ensure that provision of safe donated human milk remains an essential component of early and essential newborn care i.e., during routine care, as well as emergency scenarios, such as natural disasters and pandemics. COVID-19 has presented challenges and opportunities for health systems, the HMB sector seeks to build upon the learnings from this period to inform and improve response in the future.

Future Considerations:

Human milk Banking must remain an important area of research for the benefit of our most vulnerable NICU patients. Active research should be made worldwide in milk bank services during COVID pandemic to benefit the preterm population. Creating awareness in COVID positive healthy mothers about milk donation and counselling of recipient's parents is necessary for smooth functioning of milk bank services.

Conflict Of Interest: None

Funding strategies: None, as this was databased observational study.

Ethical Committee Response: Clearance taken from institutional ethics committee.

Acknowledgements: I would like to acknowledge the faculty, resident doctor and staff involved in patient care and admissions and lastly, I would like to thank respected Dean and respected HOD of Paediatric Department at Sassoon General hospital, Pune.

Abbreviations: HMB- Human milk Banking; IYCF -Infant and Young Child Feeding

References:

- [1]. World Health Organization. (2020b). Naming the coronavirus disease (COVID-19) and the virus that causes it. World Health Organization. [https://www.who.int/emergencies/diseases/novelcoronavirus-2019/technical-guidance/naming-the-coronavirus-disease-\(covid-2019\)-and-the-virus-that-causes-it](https://www.who.int/emergencies/diseases/novelcoronavirus-2019/technical-guidance/naming-the-coronavirus-disease-(covid-2019)-and-the-virus-that-causes-it).
- [2]. Andrews MA, Areekal B, Rajesh KR, Krishnan J, Suryakala R, Krishnan B, et al. First confirmed case of COVID-19 infection in India: A case report. *Indian J Med Res.* 2020 May;151(5):490–2.
- [3]. CDC. COVID Data Tracker [Internet]. Centers for Disease Control and Prevention. 2020 [cited 2021 Jul 19]. Available from: <https://covid.cdc.gov/covid-data-tracker>
- [4]. Gokçay G, Keskindeci G. BREASTMILK AND COVID-19. *Istanbul Tıp Fakultesi Derg.* 2020 Jun 30;83(3):286–90.
- [5]. Salvatore CM, Han J-Y, Acker KP, Tiwari P, Jin J, Brandler M, et al. Neonatal management and outcomes during the COVID-19 pandemic: an observation cohort study. *Lancet Child Adolesc Health.* 2020 Oct 1;4(10):721–7.
- [6]. Chambers, C., Krogstad, P., Bertrand, K., Contreras, D., Tobin, N. H., Bode, L., & Aldrovandi, G. (2020). Evaluation for SARS-CoV-2 in breast milk from 18 infected women. *Journal of the American Medical Association*, **324**, 1347– 1348.
- [7]. Renfrew, M., Cheyne, H., Dykes, F., Entwistle, F., McGuire, W., Shenker, N., & Page, L. (2020). Optimising mother-baby contact and infant feeding in a pandemic. Retrieved from RCM Website:
- [8]. World Health Organization. (2020b). Breastfeeding and COVID-19: Scientific brief. In <https://www.who.int/news-room/commentaries/detail/breastfeeding-and-covid-19> Accessed 10/06/2021
- [9]. Conzelmann, C., Grosse, R., Meister, T., Todt, D., Krawczyk, A., Dittmer, U., ... Pfaender, S. (2020). Preprint: Holder pasteurization inactivates SARS-CoV-2 in human breast milk. In
- [10]. Unger, S., Christie-Holmes, N., Guvenc, F., Budylowski, P., Mubareka, S., Gray-Own, S., & O'Connor, D. (2020). Holder pasteurization of donated human milk is effective in inactivating SARS-CoV-2. *CMAJ*, **192**, E871– E874.
- [11]. Walker, G., Clifford, V., Bansal, N., Stella, A., Turville, S., Stelzer-Braid, S., ... Rawlinson, W. (2020). Preprint: SARS-CoV-2 in human milk is inactivated by Holder pasteurization but not cold storage. In

Dr. Vaibhav Swami, et. al. "Impact of COVID 19 on Human milk Banking in a tertiary care teaching hospital in Western Maharashtra, India." *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)*, 20(07), 2021, pp. 50-54