



# Distribution of blood group among pregnant women in a rural area of Bangladesh

Khaleda Akter<sup>^</sup>, Hasanuzzaman Khan<sup>^</sup>, Masud Ahmed, Abbas Ibn Karim<sup>^</sup>, Jasimuddin Ahmed, M. Mostafa Zaman<sup>^</sup>

Ekhlaspur Center of Health (ECOH), Matlab North, Chandpur, Bangladesh

Correspondence to: Dr. M. Mostafa Zaman, MBBS, PhD. Ekhlaspur Center of Health (ECOH), Matlab North, Chandpur 3641, Bangladesh.

Email: mmostafazaman@gmail.com.

**Abstract:** The objective of the paper was to report blood group distribution of pregnant women of a rural area in Bangladesh. We have reviewed the records of all pregnant women's blood group data maintained by a village-level health center located in Chandpur district. The most prevalent blood group was O (35.8%, 95% CI, 31.1–40.6%) followed by B (29.3%, 95% CI, 25.1–33.9%), A (19.3%, 95% CI, 15.7–23.4%) and AB (15.6%, 95% CI, 12.4–19.4%). Rh positive remains dominant, 97.9% (95% CI, 95.9–98.9%), and almost similar across the blood groups. This finding can be useful in better planning of the transfusion needs related pregnancy and delivery of baby.

**Keywords:** ABO blood group; Rh antigen; pregnant women; Bangladesh

Received: 25 September 2020. Accepted: 21 October 2020; Published: 25 December 2020.

doi: 10.21037/jxym-20-101

View this article at: <http://dx.doi.org/10.21037/jxym-20-101>

## Introduction

ABO blood group determination has been one of the commonest clinical practices since the transfusion medicine evolved in 1940s. There is limited data on blood group distribution in Bangladesh. Only a few studies (1-5) could be retrieved from online data retrieval system. These studies reported B as the commonest blood group among general population. However, no data could be retrieved for pregnant women, although this is very important for planning pre-natal, natal and post-natal services for mother and to prevent complications from ABO and Rh incompatibility in newborns (6,7). We report here blood groups distribution in pregnant women living in a Bangladeshi village.

## Materials and Methods

Ekhlaspur Center of Health (ECOH), a village level

organization for promotion of health, is situated in Ekhlaspur, Matlab North, Chandpur, Bangladesh located about 60 km south-east of Dhaka city. ECOH runs an antenatal checkup clinic for women of Ekhlaspur since 2001 and records are maintained electronically. Women in Ekhlaspur, in general have low educational achievement, 4 in 10 women do not have any schooling. The ECOH determined blood group using slide agglutination method (8) and kept records electronically. We have reviewed the records of all pregnant women's blood group data along with age and hemoglobin level from January 2001 to December 2014. Any woman who had more than one pregnancy records, only the first one was considered for this analysis.

## Results

During the reporting period we found 430 records of pregnant women having blood group data. Their age ranged

<sup>^</sup> ORCID: Khaleda Akter, 0000-0001-8857-1649; Hasanuzzaman Khan, 0000-0002-0993-5959; Abbas Ibn Karim, 0000-0002-2467-7476; M. Mostafa Zaman, 0000-0002-1736-1342.

**Table 1** Distribution of blood group among pregnant women from a rural area of Bangladesh (n=430)

Variables	Results	
	Percent	95% CI
Age*		
15–24	62.1% (N=260)	–
25–45	37.9% (N=159)	–
Hemoglobin		
Normal ( $\geq 11.0$ g/dL)	28.8	24.3–33.7
Mild (10.0–10.9 g/dL)	55.7	50.4–60.7
Moderate (7.0–9.9 g/dL)	14.4	11.1–18.4
Severe ( $< 7.0$ g/dL)	1.1	0.4–2.9
Blood group		
A	19.3	15.7–23.4
AB	15.6	12.4–19.4
B	29.3	25.1–33.9
O	35.8	31.1–40.6
Rh antigens		
Rh negative	2.1	1.0–4.1
A	2.4	0.7–8.4
AB	3.0	0.8–10.2
B	4.0	1.7–9.0
O	0	0–0
Rh positive	97.9	95.9–98.9
A	97.6	91.6–99.3
AB	97.0	89.8–99.2
B	96.0	91.0–98.3
O	100.0	97.6–100.0

\*, 11 missing age data . CI, confidence interval.

from 15 to 45 years (mean  $\pm$  standard deviation, 23.4 $\pm$ 5.1 years). Blood hemoglobin level was 10.8 ( $\pm$ 1.2) g/dL. Prevalence of anemia was 7.2%. The most prevalent blood group was O (35.8%, 95% CI, 31.1–40.6%) followed by B (29.3%, 95% CI, 25.1–33.9%), A (19.3%, 95% CI, 15.7–23.4%) and AB (15.6%, 95% CI, 12.4–19.4%). Rh positive remains dominant, 97.9% (95% CI, 95.9–98.9%), and almost similar across the blood groups. Overall, 2.1% had Rh negative antigen. No one with blood group O had Rh negative antigen. All others had almost similar distribution:

A (2.4%), AB (3.0%) and B (4.0%) with overlapping 95% CI (Table 1).

## Discussion

This is the first study of blood group among pregnant women living in remote Bangladeshi village. Like two previous studies (3,4), we found that O is the commonest blood group in Bangladeshi women. This is also true for some other countries like India (9), Pakistan (10) and Nigeria (6). These findings will contribute to management of blood transfusion services in antenatal serology and selecting compatible blood products for pregnant women (11). It will also help reducing maternal death from obstetric or postpartum hemorrhage ensuring access to safe and sufficient blood supply during emergency (11). Additionally, it will help to minimize complications from ABO and Rh incompatibility in newborns (7). Furthermore, this study could add lights to ‘The Safe Blood Transfusion Programme’ of Bangladesh to address their issue of low resource and improvement of record keeping (12).

In conclusion, the commonest blood group of pregnant women of our study is O followed by B, A and AB which might be useful for blood banking and blood safety programme of Bangladesh.

## Acknowledgments

The authors would like to express sincere thanks to all doctors, laboratory technician, counsellors, and management committee, pregnant women of ECOH and local opinion leaders for their assistance in doing this study.

These data were obtained from the services provided by ECOH which is funded by the local community.

*Funding:* None.

## Footnote

*Conflicts of Interest:* All authors have completed the ICMJE uniform disclosure form (<http://dx.doi.org/10.21037/jxym-20-101>). The authors have no conflicts of interest to declare.

*Ethical Statement:* The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. The ECOH is run

by the local community for catering services to their fellow members. One of their initiative is to provide antenatal, natal and post-natal services to their pregnant women. Yearly campaigns are organized by the community so that every pregnant woman visit the ECOH's antenatal checkup center. The checkup is being done by women counselors. Consent from every woman are routinely kept that the data might be used for preparing reports and articles subject to anonymity. Confidentiality thus being maintained by keeping anonymized data. Only the service provider has access to the identifications. Current analysis is based on routine clinic-based services. Furthermore, community consents have been obtained in ECOH's yearly meeting with the community leaders explaining how these data will be used for better planning of their health care programme. All authors consented to the publication of this manuscript.

*Open Access Statement:* This is an Open Access article distributed in accordance with the Creative Commons Attribution-NonCommercial-NoDerivs 4.0 International License (CC BY-NC-ND 4.0), which permits the non-commercial replication and distribution of the article with the strict proviso that no changes or edits are made and the original work is properly cited (including links to both the formal publication through the relevant DOI and the license). See: <https://creativecommons.org/licenses/by-nc-nd/4.0/>.

## References

1. Zaman R, Parvez M, Jakaria M, et al. Study of ABO and Rh-D blood group among the common people of Chittagong city corporation area of Bangladesh. *J Public Health Epidemiol* 2015;7:305-10.
2. Dipta TF, Iqbal MR, Hossain AZ, et al. Distribution of phenotypic and genotypic ABO and Rhesus blood groups among Bangladeshi population. *Ibrahim Med Coll J* 2011;5:59-62.
3. Sultana R, Rahman Z, Helali AM, et al. Study of ABO and Rh-D blood groups among the common people of capital city of Bangladesh. *Int J Pharm Pharm Sci* 2013;5:814-6.
4. Hossain MM, Ataturk SK, Ekram AS, et al. Study on ABO and Rhesus Blood Groups in Rajshahi Medical College Hospital. *TAJ: Journal of Teachers Association* 2004;17:38-40.
5. Begum D, Amin MR, Khatun F, et al. Distribution of ABO and Rh blood groups among tribal population of Sylhet, Bangladesh. *J Dhaka Med Coll* 2011;20:44-50.
6. Medugu JT, Abjah U, Nasir IA, et al. Distribution of ABO, Rh D blood groups and hemoglobin phenotypes among pregnant women attending a tertiary hospital in Yola, Nigeria. *J Med Trop* 2016;18:38-42.
7. Butwick AJ, Goodnough LT. Transfusion and coagulation management in major obstetric hemorrhage. *Curr Opin Anaesthesiol* 2015;28:275-84.
8. Mujahid A, Dickert FL. Blood Group Typing: From Classical Strategies to the Application of Synthetic Antibodies Generated by Molecular Imprinting. *Sensors (Basel)* 2015;16:51-68.
9. Seema, Kumar N, Kapoor V. Frequency distribution of ABO and Rh (D) blood groups amongst pregnant women: A cross sectional survey. *Int J Med Res Prof* 2017;3:434-7.
10. Khan MN, Khaliq I, Bakhsh A, et al. Distribution of ABO and Rh D blood groups in the population of Poonch District, Azad Jammu and Kashmir. *East Mediterr Health J* 2009;15:717-21.
11. Jahanpour O, Pyuza JJ, Ntiyakunze EO, et al. ABO and Rhesus blood group distribution and frequency among blood donors at Kilimanjaro Christian Medical Center, Moshi, Tanzania. *BMC Res Notes* 2017;10:738-42.
12. World Health Organization. Situation Assessment of Public and Private Blood Centres in Bangladesh [Internet]. Directorate General of Health Services, the OPEC Foundation for International Development and World Health Organization. Dhaka, Bangladesh; 2012 [cited 2020 May 12]. Available online: [https://www.who.int/bloodsafety/transfusion\\_services/Bangladesh\\_SituationAssessmentPublicPrivateBloodCentres.pdf?ua=1](https://www.who.int/bloodsafety/transfusion_services/Bangladesh_SituationAssessmentPublicPrivateBloodCentres.pdf?ua=1)

doi: 10.21037/jxym-20-101

**Cite this article as:** Akter K, Khan H, Ahmed M, Karim AI, Ahmed J, Zaman MM. Distribution of blood group among pregnant women in a rural area of Bangladesh. *J Xiangya Med* 2020;5:38.