



ABO and Rhesus Blood Group Distribution among Garment Factory Workers

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Abstract

This was a retrospective study and record of ABO and Rhesus blood group results of Garments Factory Workers obtained from the Mahanaz Style and Crafts Ltd, Savar, Dhaka. Descriptive statistics were used. Results were expressed as percentages/proportions, means and average. The objective of this study is to have information on the distribution of ABO and Rhesus blood group among the garments factory workers to determine the need for routine screening for hemolysin among blood group O, as well as to factory Blood donor registry for Rhesus negative blood group. In this study Two thousand twenty nine samples were obtained of which 1326 were females and 703 male with the ratio of 1.9: 1. Among the study population, blood group O was the highest (34.2%), followed by blood group B (32.2%), A (24%) and AB (9.6%). Rhesus positive was 96% while Rhesus negative was 4%. Routine screening for hemolysin among blood group O and factory Blood donor registry is to be done in all Garments factories.

Keywords: ABO and Rhesus (D) Blood Group; Garments Factory Workers; Donors

Introduction

Several blood group systems have been identified but ABO and Rhesus blood groups are the most important in transfusion medicine. ABO blood group was discovered by Landsteiner in 1900, and was later followed, in 1939, by the discovery of the rhesus system, the second most important blood group system after ABO [1]. The determination of blood groups is based on inherited antigenic substances which are located on the surface of red blood cells.

In the ABO system, individuals are classified into four major blood groups namely, A, B, AB and O, depending on the type of antigen present on the red cell surface while in the Rhesus system, they are classified into Rhesus positive and Rhesus negative [2]. In addition to the importance of these blood groups in transfusion medicine, they have also been found useful in population genetic studies, organ transplantation as well as in resolving medico-legal issues such as disputed parentage. Moreover, there are several reports in which some associations have been found between ABO and Rhesus blood group systems and certain diseases. For instance, ABO blood group has been reported to be associated with the risk of developing gastric cancer, peptic ulcer disease as well as vascular disease [3,4].

A number of studies were conducted to determine the frequency of ABO and Rhesus blood groups with diverging phenotypic results across various ethnic populations in different geographical regions. In Caucasians in the United States, the distribution is 47% for group O, 41% for group A, 9% for group B and 3% for group AB. Among the African Americans, the distribution is 46% for group O, 27% for group A, 20% for group B and 7% for group AB. In the Orientals, the distribution of blood group is 36% for group O, 28% for group A, 23% for group B and 13% for group AB [5]. In Nigeria, different studies have also reported similar findings with blood group O having the highest frequency, followed by A, then B while AB has the lowest frequency [6-8]. As blood group determination is important in clinical practice, it was desirable to find out the prevalence of different blood groups among workers of Garment Factory named Mahanaz Style and Crafts Ltd., where no earlier data was available. The present study was, therefore, carried out to determine the distribution of ABO and Rhesus blood groups among workers of Mahanaz Style and Crafts Ltd. The aim is to have information on the distribution of these blood groups which may help to improve blood transfusion services, by routine screening for hemolysin among blood group O, as well as factory of donor registry for Rhesus negative blood group. This will help to prevent

hemolytic transfusion reactions and death, hemolytic diseases of the fetus and newborn as well as to make easy accessibility to rhesus negative blood for transfusion especially in cases of emergency.

Materials and Methods

This was a retrospective study and record of ABO and Rhesus blood group results of workers screened between August 2017 and February 2018 from the Mahanaz Style and Crafts Ltd. Descriptive statistics were used to compute percentages and averages. Results were presented in tables and charts and expressed as percentages/proportions, means and average. In this Garment Factory “Thalassemia Hospital and Institute” (A Project of Institute of Allergy and clinical Immunology of Bangladesh -IACIB)” has been providing

SRHR (Sexual and Reproductive Health and Rights care services). So it became easy to work for Blood Grouping for IACIB in this Factory.

Results

Two thousand twenty nine samples were tested of which 1326 were females and 703 males with the ratio of 1.9: 1. Among the population studied, blood group O had the highest frequency, 693 (34.2%), followed by blood group B 655 (32.2%), A 487 (24%), and AB had the least frequency, 194 (9.6%) (Figure 1). According to the rhesus system, most of the workers were found to be Rhesus positive with frequency of 1951 (96%) while Rhesus negative was 78 (4%) (Figure 2).

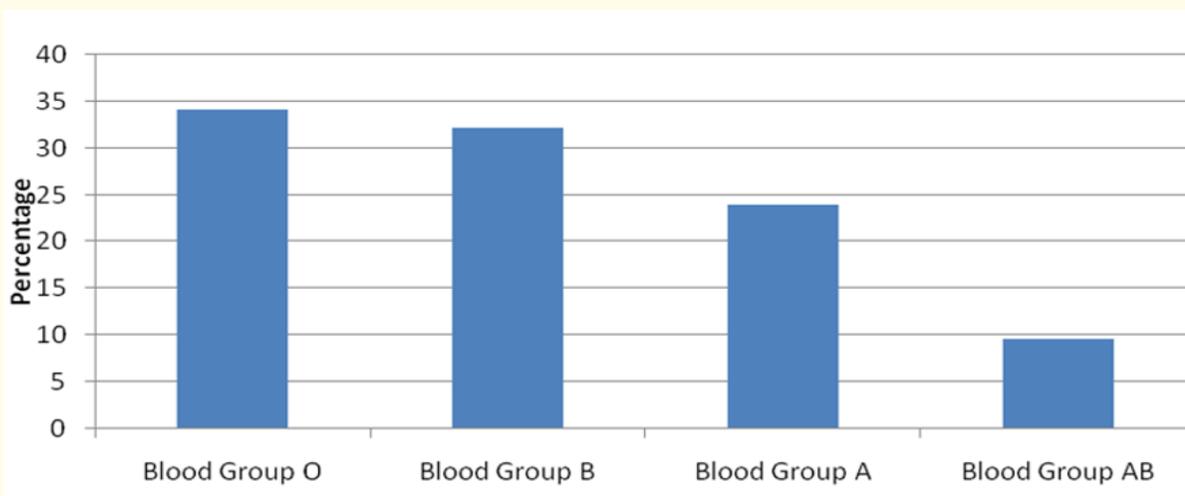


Figure 1: ABO blood group distribution of the workers.

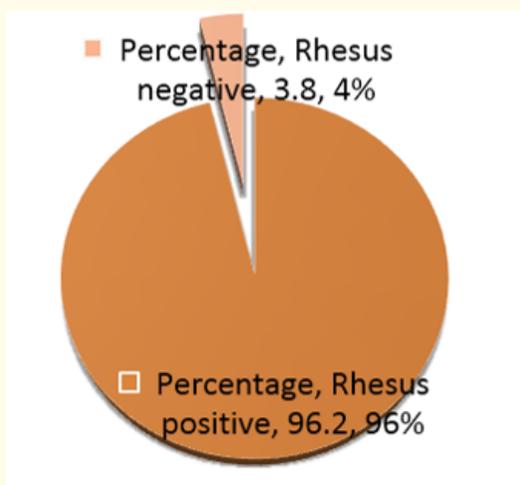


Figure 2: Rhesus blood group distribution pattern among the Garment workers.

Among the female workers, blood group O had the highest frequency, 445 (33.6%), followed by blood group B 429 (32.3%), Blood group A, 323 (24.4%), while blood group AB was the least, 129 (9.7%). Likewise, among the male workers, blood group O was the highest with a frequency of 248 (35.3%), followed by blood group B 226 (32.1%), Blood group A and AB were 164 (23.3%) and 65 (19.3%) respectively (Table 1). Most of the female and male workers were found to have rhesus positive blood group, 1282 (96.7%) and 669 (95.2%) respectively (Table 2).

ABO Blood	Females		Males	
	Frequency	Percentage	Frequency	Percentage
O	445	33.6	248	35.3
B	429	32.3	226	32.1
A	323	24.4	164	23.3
AB	129	9.7	65	9.3
Total	1326	100	703	100

Table 1: ABO Blood group distribution according to gender.

Rhesus blood group	Females		Males	
	Frequency	Percentage	Frequency	Percentage
Rhesus positive	1282	96.7	669	95.2
Rhesus negative	44	3.3	34	4.8
Total	1326	100	703	100

Table 2: Rhesus blood group distribution according to gender.

Blood group	Frequency	Percentage
O ⁺	659	32.5
B ⁺	632	31.1
A ⁺	474	23.4
AB ⁺	186	9.2
O ⁻	34	1.7
B ⁻	23	1.1
A ⁻	13	0.6
AB ⁻	8	0.4
Total	2029	100

Table 3: Distribution of ABO and Rhesus blood group among Garments Workers.

With respect to rhesus blood group system among the population studied, blood group O⁺ was the most common with frequency of 659 (32.5%), followed by B⁺ 632 (31.1%), A⁺ 474 (23.4%) and AB⁺ 186 (9.2%), whereas among the rhesus negative workers, blood group O⁻ was the most frequent 34 (1.7%), blood group B⁻ and A⁻ were 23 (1.1%) and 13 (0.6%), AB⁻ was 8 (0.4%), as shown in table 3.

Discussion

In this study, blood group O was found to be the most common, followed by group B, then A, while the least frequent was blood group AB. Our result is in accordance with the report of previous studies which also found blood group O to be the most common, while blood group AB was the least frequent [9,10]. However, some studies have reported either blood group A or B to be the most prevalent blood group. Sharma, *et al.* reported blood group B as the most prevalent one in India [11]. Similarly, Khan, *et al.* showed the frequency of blood group B to be the highest among the Pakistan population studied [12]. Such contradictions are probably due to geographical environment and ethnic groups in the study populations. Moreover, it shows that specific ABO blood groups might be distributed in different regions of the world. It also depends on the number of samples studied and target population.

Blood group O was initially regarded as a universal donor and so can be given to anybody with any other blood group. It has been documented that some blood group O individuals have high titer of hemolysin [13], an anti-A and anti-B antibodies in their plasma. It may cause hemolytic transfusion reaction and death when such blood group O is transfused to anybody with any other blood type apart from group O. Since majority of the study population have blood group O, there is a need for routine screening for hemolysin among blood group O individuals.

In this study we also found that among the both male and female workers, blood group O was the highest frequency, followed by blood group B, A and AB in that order. This corroborates with findings of previous studies that reported similar pattern of ABO blood group distribution among both sexes [8]. However, some other studies reported blood group A to be the most frequent among males, while blood group B was the highest frequency among females [14,15]. Most of the male and female workers were found to have rhesus positive blood group as also reported by previous studies [6,8]. This shows that inheritance of ABO and rhesus blood groups are not sex-linked [2].

Among the study population, most of the workers were Rhesus positive while only a minority was rhesus negative. A similar finding was also reported by previous studies [16]. These findings confirmed the trend of relatively low incidence of rhesus negativity and beyond [5,16].

Conclusion

Blood group O was found to be highest among the study population with prevalence of 34.2%, followed by B, A and AB. Most of the workers were found to be Rhesus positive while only a minority was Rhesus negative. This finding will be useful in health care planning, genetic counseling and running of an organized, efficient and safe blood transfusion services. Factory of blood donor registry is also recommended for easy accessibility to rhesus negative blood for transfusion especially in cases of emergency and also to prevent hemolytic disease of the fetus and newborn. This study and record of Blood group is very helpful for smooth running of blood transfusion services of Thalassemia patients of Thalassemia Hospital and Institute, who need frequent blood transfusion.

Bibliography

- Landsteiner K and Wiener AS. "An agglutinable factor in human blood recognized by immune sera for rhesus blood". *Proceedings of the Society for Experimental Biology and Medicine* 43 (1940): 223-224.
- Contreras M and Daniels G. "Antigens in human blood". In: Hoffbrand VA, Catovsky D, Tuddenham EGD, Green AR (eds). *Postgraduate haematology*. 6th edition. Oxford UK, Wiley-Blackwell (2011): 244-258.
- Edgren G., et al. "Risk of gastric cancer and peptic ulcers in relation to ABO blood type: A cohort study". *American Journal of Epidemiology* 172.11 (2010): 1280-1285.
- Wu O., et al. "ABO(H) blood groups and vascular disease: a systematic review and meta-analysis". *Journal of Thrombosis and Haemostasis* 6.1 (2008): 62-69.
- Pramanik T and Pramanik S. "Distribution of ABO and Rh blood groups in Nepalese students: a report". *The Eastern Mediterranean Health Journal* 6.1 (2000): 156-158.
- Nwuche CA and Ejele OA. "ABO and rhesus antigens in a cosmopolitan Nigeria population". *Nigerian Journal of Medicine* 13.3 (2004): 263-266.
- Falusi AG., et al. "Distribution of ABO and RH genes in Nigeria". *African Journal of Medicine and Medical Sciences* 29.1 (2000): 23-26.
- Enosolease ME and Bazuaye GN. "Distribution of ABO and Rh-D blood groups in the Benin area of Niger-Delta: implication for regional blood transfusion". *Asian Journal of Transfusion Science* 2.1 (2008): 3-5.
- Obeagu EI., et al. "Frequency distribution of ABO, Rh blood groups and blood genotypes among the students and staff of Michael Okpara University of Agriculture, Umudike Abia State, Nigeria". *IJRRPAS* 3.4 (2013): 561-565.
- Hassan A., et al. "The pattern of distribution of ABO blood groups in North Western Nigeria". *Annals of Nigerian Medicine* 1.2 (2005): 17-18.
- Sharma D., et al. "Prevalence and distribution of ABO and Rh-D antigens along with its subgroups and rare types in greater Gwalior region". *Open Journal of Blood Diseases* 3.2 (2013): 69-73.
- Khan MS., et al. "Trends in blood groups and Rh factor in the twin cities of Rawalpindi and Islamabad". *Journal of Pakistan Medical Association* 56.7 (2006): 299-302.
- Olawumi HO and Olatunji PO. "Prevalence and titre of alpha and beta hemolysins in blood group O donors in Ilorin". *African Journal of Medicine and Medical Sciences* 30.4 (2001): 319-321.
- Ghobadian Z., et al. "Disribution of ABO and Rh blood groups in a major ethnic group of the West Iran, the Kurdish population". *Asian Journal of Medical Sciences* 5.3 (2014): 26-29.
- Rai V and Kumar P. "Genetic analysis of ABO and Rh blood groups in Backward Caste Population of Uttar Pradesh, India". *Journal of Natural Science, Biology and Medicine* 3.3 (2011): 7-14.
- Odokuma EI., et al. "Distribution of ABO and Rhesus blood groups in Abraka, Delta State, Nigeria". *Nigerian Journal of Physiological Sciences* 22.1-2 (2007): 89-91.

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