

## **Original Research Article**

### **Incidence of a rare blood group at Sree Balaji medical college and hospital blood bank**

**Kavitha. A<sup>1</sup>\*, Govindarajan. R<sup>2</sup>, Parijatham. B.O<sup>3</sup>, Bagavadgeetha M<sup>4</sup>, Navaneeth A<sup>5</sup>**

<sup>1,2,3</sup>Department of Pathology, Sri Balaji Medical College, Chrompet, Chennai, India

<sup>4</sup>Department of Physiology, Sri Ramachandra University, Porur, Chennai, India

<sup>5</sup>Clinical Investigator, Endo Pharma private limited, Chennai, India

#### **\*Corresponding author**

Dr. Kavitha. A

Email: aakavi2789.@gmail.com

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**Abstract:** After every transfusion patient is getting a rebirth so, transfusion department and its staff and their service gaining much importance in hospital. A mismatch blood transfusion can easily kill a patient due to transfusion reaction and transfusion in turn depends on blood grouping serology. Common blood group we come across in India are A(22.88%), B(32.26%), AB(7.74%) and O(37.12%). Distribution of ABO blood group among donors in South India O (38.75%) B (32.69%) A (18.85%) AB (5.27%), Bombay blood group (0.004%). The objective is to find the incidence of Bombay O blood group in Sree Balaji Medical College Hospital blood bank and thus to prevent transfusion reaction. The material and methods were Blood grouping and typing done for all samples from donors and patients of Sree Balaji Medical College and Hospital Blood Bank from July 2014 to January 2016 was included in our study. Serological test done with tube agglutination method and further confirmed by gel card method. In Results Of total 8903 grouping and typing done we had 22%A, 32%B 7%AB 38%O of which 0.02% Bombay blood group in O was detected, one was from patients blood and other one was a donor blood. Conclusion: Vigilant screening for Bombay blood group in O group plays a vital role, though it appears rarely it has to be diagnosed for prevention of transfusion reactions and also it is important to intimate to donor about his specialised blood and to be reserved only for Bombay blood group patients.

**Keywords:** Bombay group, transfusion reaction, Vigilant screening

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#### **INTRODUCTION:**

Bombay blood group was first discovered by Bhande *et al.*; in the year 1852 in India (Bombay). Bombay blood group was first discovered when an individual found to have red cells without H Antigens and plasma reacted with all blood groups (A,B,O)[1]. ABO group has antigens ABH, A and B are secreted by H antigen, H antigen is produced by H gene FUT1 located in chromosome 19 secrete glucosyltransferase which adds L-fucose to a precursor to produce H antigen. A and B transferase produce A and B antigen from H antigen. In O group people have inactive transferase so H persists [2]. Rarely O group red cells fail to express H transferase thus the blood is characterized by absence of A,B,H Antigen and presence of AntiA, Anti B, AntiH[3]. This rare blood is typed Bombay blood group, it reacts with O group blood itself even though simple typing shows it as O group. The peculiarity of this blood group is they can either get autologous blood transfusion or receive blood from another Bombay blood group person[4]. There are two phenotypes resulting from products or lack of products of two different alleles FUT1 and FUT2 gene

[5]. In India FUT1 mutation seen many times with complete deletion of FUT2 [6].

#### **MATERIAL AND METHODS:**

All blood samples received during July 2014 to January 2016 to Sree Balaji Medical College Hospital blood bank were taken into study. Blood grouping and typing is done using tube agglutination method by forward grouping (patient cell and Anti A, Anti B, Anti D) and by reverse grouping (patient serum and pooled O cells, A cells and B cells) for ABO phenotype and Rh factor. Further for all O positive groups grouping for Bombay blood group is done using tube method by forward grouping (patient cell and AntiH) and reverse grouping with (patient serum and pooled O cell) the reaction is viewed under microscope. It is confirmed by using gel card method.

#### **RESULTS:**

Following inferences obtained, Of the 8903 samples received 22 % A 32% B 7% AB 38% O of which 0.02% of Bombay blood group. Forward tube test (donor cells with anti H) showed no agglutination

and reverse (pooled cells with donor serum) showed agglutination. Which is verified under microscope, agglutination was seen in reverse grouping and no agglutination in forward grouping. Further absence of A,B, H antigens in red cells is shown by absence of agglutination in forward grouping in gel card method but agglutination with Anti D .Presence of antibodies (antiA, antiB, anti H) in serum is shown by agglutination in reverse grouping, which is confirmed using gel card method which is the most sensitive technique. It is also confirmed by cross matching with O positive recipient showed reverse incompatibility confirming it to be Bombay blood group. When testing for Bombay blood group following findings are obtained.

Reverse grouping with tube method shows agglutination (figure 1) and its smear showing agglutination (figure 2).

Forward grouping shows no agglutination (Figure 3) and its smear showing absence of agglutination (Figure 4)



Fig-1



Fig-2



Fig-3

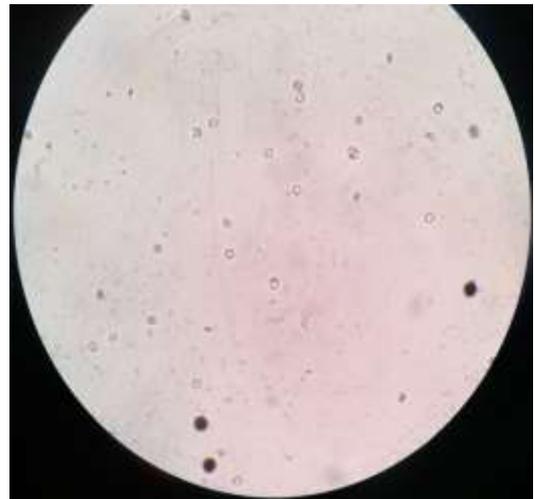


Fig-4

Grouping with gel card method (figure 5) and cross matching with another O positive blood group showing minor incompatibility in gel card test (figure 6)

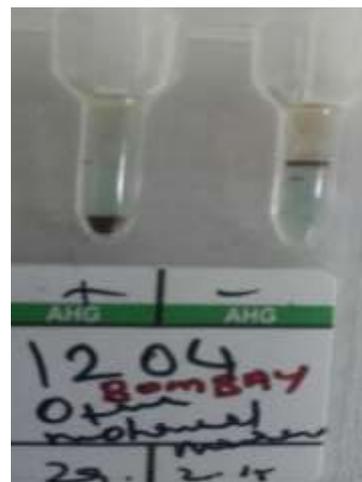


Fig-5

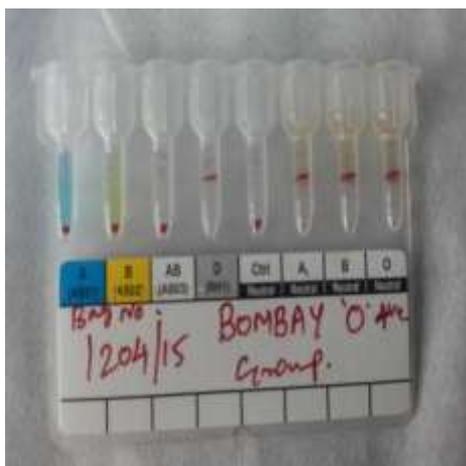


Fig-6

### DISCUSSION:

A rare blood group Bombay O blood group has an incidence in India 1 per 10,000. Incidence in Europe is 1 per million. Bombay O blood group distribution in India seems to be more in western and southern states than other parts [7]. Prevalence in Tamil Nadu is 0.004%. Incidence of Bombay O varies A study conducted by. Fernandez-Mateos *et al.* shows of total 179 people 112 from Maharashtra, 14 from Karnataka, 5 from Andhra Pradesh, 8 from Goa, 6 from Gujarat, and 5 from Uttar Pradesh. Incidence seems to be more in places where they practice consanguineous marriage e.g. Andhra Pradesh, Gujarat.[8] In our study also one person has history of consanguineous marriage. Bombay O blood group found to be confined to south East Asian region. Prompt Bombay O detection plays a vital role in decreasing transfusion reaction. Hajedahshashaani *et al.* showed a case of transfusion reaction due to Bombay O group [9]. Recently haemovigilance programme also plays a vital role in reducing morbidity and mortality throughout the world now for safe blood transfusion [10]. Rapid urbanization also increases the incidence of Bombay O blood group [11,12].

### CONCLUSION:

Incidence in Sree Balaji Medical College Hospital Blood Bank was found to be 2 cases of Bombay blood group among 8903 blood grouping and typing done during the study period. One was detected in 40 year old female whose blood was cross matched before surgery and was found to be Bombay blood group. Another was detected from an 31 year old well-built male native of Tamil Nadu with history of consanguineous marriage with no previous history of blood donation or surgeries with no significant medical or surgical history, donated blood having bag no.1204/15 was found to be having a rare Bombay blood group This study report was published in an intention to

create awareness among blood bank medical staffs, technicians and present generation medical students[12]so they will be conscious about rare blood group Bombay O. Thus transfusion reactions to patients can be prevented. A rare blood group the Bombay O when identified in a donor need not be wasted rather can be reserved for another Bombay O group patient.

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