

Bombay Blood Group

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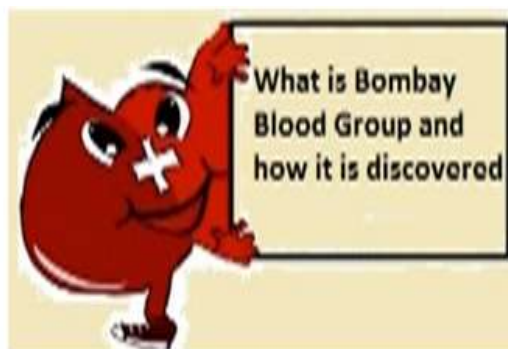
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ABSTRACT:Most of us are not aware about such blood group's existence on planet. Bombay blood group is named so because the first case was found in Bombay (now Mumbai) the financial capital of India. Bombay blood group is very few people who not have antigen H in their blood and have antigen H as well as do not have B antigen. Bombay phenotype is found in log 10,000 individual in India. People with this blood type can receive blood only from other donors who are as long H Deficient . There is a serum grouping called reverse grouping for accurate test of person ABO group, if this test conducted then we can detect the presence of H antibody which indicate Bombay blood group .

KEYWORDS:Bombay Blood group, Antigen, Antibody, phenotype, ABO group.

I. INTRODUCTION

Blood, a connective tissue is inevitable for human existence. Normally it is believe that the rare blood group is O negative, which is very difficult to get because of it was found to be in only some selected people on earth. But rather than the O negative blood group there is also one of the most rarest blood group which exist on the earth . This blood group was found in only in one of the million people , and it's name as bombay blood group. The bombay blood group is rare blood group, phenotype of this blood group which has lacking of the H antigen on the surface of red blood cell membrane and have antigen H in the serum. This types of the blood group is rarest blood group so the main fact is that there is proper blood grouping and proper cross matching is required for safe blood transfusion in the individuals.



II. DEFINITION

The Bombay blood group is a rare blood group, phenotypes of this group lacking H antigen on the red cell membrane and have anti-H in the serum.

III. DISCOVERY

Bombay blood group phenotype was first discovered by the croaker YM Bhende in the time of 1952. This is called Bombay Blood because of it was first set up in the some people of Bombay. This type of rarest blood type set up in only in the world of 0.0004 percent of the population. It occurs due to the point mutation of the H gene if the case carries two mutant gene,(H Gene) also it'll be a result in Bombay or Oh phenotype. Bombay blood group is a rare blood type. People with this blood type always show up as type O On a blood test. But they can have hidden DNA for other blood types, which they may pass on to a child. This veritably rare blood type is most " common " in southeast Asia. For illustration, around 1 Person in,000 has this blood type in India. It's important rarer in other corridor of the world. It's literally A 1- in-a-million event in people with European strain! It's so rare that people with this blood Type can't reliably get a blood transfusion. The Bombay blood group is a veritably rare blood group. That's generally present in about 0.0004(about 4 million) of the total mortal population, although The

circumstance in Mumbai is as important as 0.01, which means 1 in 1,000 may retain the blood Group. Given the oddity of the blood group, blood transfusion of this phenotype is a delicate Task. People having Bombay phenotype are substantially confined to the Southeast Asia. Around 179 Persons in India with a frequency of 1 in 1,000 have “ Bombay Blood group ”. A high position of Consanguinity present among the parents of the Bombay phenotype.

IV. SIGNIFICANCE

- Rare blood Group
- Lacking of H antigen
- inheritance of two rare recessive h genes
- Bombay group individuals antibody that react against all ABO blood group
- Autosomal recessive phenotype

V. WHAT'S BOMBAY BLOOD GROUP

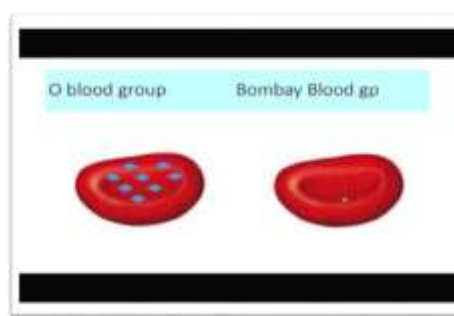
To conclude Bombay blood group rather know to the blood cluster, when someone says that his blood group A it means that the person has antigen strain A and antibody strain B in their blood. People with blood group AB means that their blood hold both A and B both antigen and no antibody in their blood. People with O blood group which has their blood contains both A and B antibody and no antigen in their blood. still What's generally contain known is that all these group has antigen H in their blood as well. There are veritably many people who don't have this type of antigen H in there blood. first of this people contains the antibody H because Which of no other Blood offer to them.

Chart no. 1.Given below

Blood Groups (Antigens and Antibodies)		
Blood Group	Antigens	Antibodies
A	A,H	B
B	B,H	A
AB	A,B,H	-
O	H	A,B
Bombay Blood Group	-	A,B,H

VI. WHY BOMBAY BLOOD PEOPLE TESTED AS 'O'

Bombay blood group is a rare blood group in which there's the absence of H antigen and presence of anti-H antibodies. At the time of blood grouping, this blood group mimics O blood group due to the absence of H antigen, but it shows incompatibility with O group blood during cross matching. In this blood group, no “ A ” or “ B ” antigens are linked on red blood cells or in concealment. By description, that would fit the type “ O ” blood type. In Bombay phenotype, there's a void of A antigen, B Antigen as well as H antigen. The Bombay(Oh) phenotype is characterized by the absence of A, B, and H antigens on red cells and occurs infrequently, especially in ethnical populations of India. Bombay blood group don't retain the A or B antigens, it's generally comprehended as the' O' blood type. It's only after a specific test for H Antigen in the blood is performed which can make a distinction between Bombay blood group and' O' bloodgroup. Normally it's believed that the rare blood group is O negative, which is veritably delicate to get because it's set up only in named people. But rather than O negative there's a rarest blood group that's set up in any one of the millions of people, and its name is Bombay Blood Group, antigen insufficiency is known as the" Bombay phenotype h/ h, also known as Oh) and is set up in 1 of,000 individualities in India and 1 in a million people in Europe.



VII. BOMBAY BLOOD PHENOTYPE LABORATORY DISCOVERY AND TRANSFUSIONS RECOMMENDATIONS

Our main blood types routinely linked moment are A, b, Ab, and O. Universal benefactors have type “ O ” blood, and have no “ A ” or “ b ” antigens. In turn, no blood responses will do in donors. Again, universal donors having type “

Ab⁺ blood will have no antibodies to the “ A ” or “ b ” Antigens. Bombay phenotype has no “ A ” or “ b ” antigens, classifying it as “ O ” blood type. likewise, Bombay phenotype lacks expression of the H antigen, which is present on every Blood cell. When mixed with any type of blood other than Bombay blood, haemolytic responses do. A 55-time-old joker had his blood compartmented and screened after trauma activation for an eye Injury. On forward grouping, the case was linked as blood type “ O ”. On rear grouping, Agglutination passed. Laboratory procedures were estimated and an expanded antigen panel was Performed which verified this cohesion, which led to the dubitation of a rare blood type. The Case didn't bear blood transfusion and was farther estimated by New York blood center Where the opinion of Bombay Phenotype was verified. This case emphasizes the significance of Proper laboratory examinations for rare blood types, precautionary strategies, as well as operation of Bombay blood type.

VIII. HOW BOMBAY BLOOD GROUP IS IDENTIFY?

In this blood group, no “ A ” or “ B ” antigens are linked on red blood cells or in concealment. By description, that would fit the type “ O ” blood type. In Bombay phenotype, there's a void of A antigen, B Antigen as well as H antigen.

(Is shown in chart no. 2)
 Chat no. 2



IX. NOMENCLATURE OF BOMBAY BLOOD GROUP...

- Number of H antigens: 1
- ISBT symbol: H
- ISBT number: 018
- Gene symbol: FUT1
- Gene name: Fucosyltransferase I[3]

X. PROPERTIES OF BOMBAY BLOOD GROUP

1. The Bombay blood group is a rare blood group, phenotypes of this group lacking H antigen On the red cell membrane and have anti-H in the serum
2. It fails to express any A, B or H antigen on their red cells or other tissues.
3. The existence of a human H/h genetic polymorphism was first established by Blende et al.
4. Bombay blood group do not possess the A or B antigens, it is usually comprehended as the ‘O’ blood type.
5. The Bombay group (Oh) results from the inheritance of two rare recessive h genes which Occur at a locus other than the ABO gene locus
6. H antigen deficiency is known as the “Bombay phenotype” (h/h, also known as Oh) and is found in 1 of 10,000 individuals in India and 1 in a million people in Europe.
7. Absence of H. A and B antigens, No agglutination with anti A, anti B or anti H lectin.
8. Presence of anti A. Anti B, anti AB and potent wide thermal range anti H in serum.
9. A, B, H non secretor no A, B, or H substances present in saliva)
10. Absence of H enzyme in serum and H antigen on red cells
11. Presence of A or B enzyme in the serum and red cells.
12. A recessive mode of inheritance.
13. Red cells of the Bombay blood group are compatible only with the serum from another Bombay individual.

XI. DISCOVERY

It's delicate to determine Bombay blood group people when conventional blood group test is carried on. The Usual sampled for ABO blood group network would display them as array O. There's a serum grouping Called reversed grouping for true test of persons ABO group. If this test is operated also we Can determine the presence of H antibody which indicate Bombay blood group. This is conducted with The help of reagent called H-Lectin which has anti H like exertion. Therefore it's used to determine the Presence or absence of the H antigen or the face of RBCs. The Bombay phenotype detected was farther confirmed by certain technical tests like immersion elution studies, titration being Antibodies at different study on anti H by O slaver secretor, and secretor scene of the person.

Chart. No. 3

Cell grouping is carried out operating anti A, Anti B and Anti AB commercially obtainable sera. Serum Grouping is carried out using A cells, B cells and O cell.

Cell grouping		Serum grouping		Interpretation			Blood Group
Anti A	Anti B	Anti AB	A cells	B cells	O cells		
+	-	+	-	+	-	A	
-	+	+	+	-	-	B	
+	+	+	-	-	-	AB	
-	-	-	+	+	-	O	
-	-	-	+	+	+	BOMBAY	

XII. GENETICS

The Bombay Blood group occurs in those individualities who have inherited two recessive strains of The H gene. Similar individualities don't produce the H carbohydrate. AS both parents carry the allele to transfer this blood type to their kids. In extension, the Bombay Blood has further chances of both parents and the youngling being of the identical blood strain. Other exemplifications may include noble families, which are ingrained due to custom rather than original inheritable Variety. Bombay phenotype occurs in individualities who have inherited two recessive alleles of the H gene(i.e. their genotype is hh). These individuals don't have the H carbohydrate that's the Precursor to the A and B antigens, meaning that individualities may retain alleles for either or both Of the A and B alleles without being

suitable to express them. Because both parents must carry this Recessive allele to transmit this blood type to their children, the condition substantially occurs in small Closed- off communities where there's a good chance of both parents of a child either being of Bombay type, or being heterozygous for the h allele and so carrying the Bombay specific as sheepish. Other exemplifications may include noble families, which are ingrained due to custom rather than Original inheritable variety. It's veritably important, in order to avoid any complications during a blood Transfusion, to descry Bombay phenotype individualities because the usual tests for ABO blood group System would show them as group O. Since Anti-H immunoglobulin can spark the complement Cascade, it'll lead to the lysis of RBCs while they're still in the rotation, stimulating an acutehaemolytr'nsfusion response. This, of course, can not be averted unless the lab technologist that's involved has the means and the study to test for Bombay group.

XII. COMPARISON BETWEEN BOMBAY BLOOD GROUP & NORMAL (O) BLOOD GROUP

What are the Similarities Between Bombay Blood Group and O Blood Group?

- Bombay Blood Group and O Blood Group are two types of blood groups.
- Neither A antigens nor B antigens are present in both blood groups.
- Also, both can receive blood only from the people who have the same blood group.
- Furthermore, usual tests for ABO blood group system would show both blood groups Group O, which is incorrect.
- Moreover, A and B antibodies are present in both blood groups.
- Thus, specific antigen test for H antigen is required to differentiate both Bombay blood Group and O blood group.

What is the Difference Between Bombay Blood Group and O Blood Group?

- Bombay blood group is one of the rarest blood groups while O blood group is a common Blood group.
- Both these blood groups have neither A antigens nor B antigens. Hence, the results of the Usual blood tests are the same for both blood groups. But there is a difference between Bombay blood group and O blood group.
- Bombay blood group does not have H antigens or H gene while O blood group has H Antigens and H gene.
- Furthermore, Bombay blood group has H antibodies while O blood group does not have. This is another difference between Bombay blood group and O blood group.

XIII. CONCLUSION

The Bombay blood group is a veritably rare blood group discovered nearly 60 times back. The Bombay Blood group discovery requires proper blood grouping and cross matching of the blood samples. This group would be distributed as the “O” group as it doesn’t show any response to anti-A and Anti-B antibodies just like normal “O” group. When cross matching with “O” group is done, also It would show cross reactivity or incompatibility. The Bombay blood group is a rare blood group, Phenotypes of this group lacking H antigen on the red cell membrane and have anti-H in the serum. It fails to express any A, B or H antigen on their red cells or other tissues. Thus rear Grouping or serum grouping has to be done to determine this group. As Bombay blood group is a rare blood group, it’s desirable to develop cryopreservation installations For rare blood donator units. Every blood bank should maintain a rare blood type donator range with the Help of Emergency obstetric care(EmOC) services so as to arrange blood in times of Obstetric need and help motherly mortality.

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