

# Study on Frequency of ABO Blood Grouping and Rhesus Phenotype Distribution in Tamil Nadu and Pondicherry of South India

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## Abstract

Blood is a fluid which we have in our bodies that carries oxygen from the lungs to the rest of the body and also waste to be eliminated from the body. ABO and Rh blood group system is the most important system in transfusion and organ transplants. Though, many studies have been conducted in various parts of India to determine the local ABO and Rh distribution, no Indian study has so far been conducted to explore the South Indian especially Tamil Nadu and Pondicherry ABO and Rh distribution. The present study made an attempt to provide data on ABO and Rh blood group distribution across Tamil Nadu and Pondicherry. A total of 25,000 subjects of college students were included in this study and ABO and Rh (D) grouping was performed on all these samples. Data on the frequency of ABO and Rh(D) blood groups was expressed in simple numbers and percentages. The present study explored Among the ABO grouping system the highest frequency of blood group was found to be group O [10023(40.09%)], followed by group B [7447(29.79%)], and group A [6393(25.57%)]. The least common blood group was AB group [1137(4.55%)]. 94.69% Rh antigen was detected and the prevalence of Rh – ve was 5.13%. Of the 25000 individuals, the most common blood group was O followed by B and A and the least blood group was AB. The present study provides information about the relative distribution of various ABO blood grouping in the Tamil nadu and Pondicherry. This vital information may be helpful in planning for future health care blood transfusion services.

**Keywords:** ABO; Blood Grouping; Rhesus.

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## INTRODUCTION

Blood is a fluid which we have in our bodies that carries oxygen from the lungs to the rest of the body and also waste to be eliminated from the body. It delivers oxygen and essential nutrients (such as fats, sugars, minerals, and vitamins) to the body's tissues. It carries carbon dioxide to the lungs and other waste products to the kidneys for elimination from the body. Though we have made tremendous discoveries and inventions in the field of Science we are not yet able to make the magic potion called blood which has no substitute. Artificial / synthetic blood is still in research stage, even if tomorrow's science can come out with artificial blood which will be a very costly item for the developing countries like India.

Many lives are saved throughout the world each year through the use of blood transfusions, by preventing death from loss of blood due to trauma, and by allowing performance of surgical procedures which would otherwise be impossible. Apart from their

importance in blood transfusion practice, ABO and Rh blood grouping are useful in population genetic studies, researching population migration patterns as well as resolving certain medico-legal issues, particularly disputed parentage, genetic research, forensic pathology. In modern medicine, the need for blood group frequency and prevalence studies is multipurpose, as besides their importance in evolution, their relation to disease and environment is being increasingly important [1]. The distribution of these ABO and Rh blood groups has been repeatedly investigated in various populations all over the world during the last several decades and their frequencies exhibited considerable variation in different geographic locations, reflecting the underlying genetic and ethnic diversity of human populations [2].

The frequencies of ABO and Rh blood groups vary from one population to another. Few studies of ABO and Rh blood group prevalence among the various populations of India have been carried out. Data

on frequency distribution of ABO and Rh in Tamil Nadu and Pondicherry of South India are not available. The present study was made an attempt to determine the south Indian wide ABO and Rh distribution.

## MATERIALS AND METHODS

A retrospective study was carried across the Tamil Nadu and Pondicherry, South India. The blood groups of either sex presenting over a period of 6 months (from January – June 2019) were studied.

### Subject

Healthy subjects of age group between 18 and 24, were informed about the goal of this study, and those who agreed to participate, ABO and Rh typing was carried using standard agglutination test.

## STATISTICAL ANALYSIS

Percentage & proportions for each ABO and Rh blood groups distribution are calculated

## RESULTS

The distribution of ABO and Rh blood groups was recorded in 25000 individuals. The percentage of A, B, AB, and O blood group among the studied subjects shown in Table.1 and Rh phenotype in Table No. 2. The distribution of ABO and Rh-D blood groups was studied among 25000 individuals across Tamil Nadu and Pondicherry. Highest frequency of blood group was found to be group O [10023(40.09%)], followed by group B [7447(29.79%)], and group A [6393(25.57%)]. The least common blood group was AB group [1137(4.55%)]. 94.69% Rh antigen was detected and the prevalence of Rh – ve was 5.13%. Of the 25000 individuals, the most common blood group was O followed by B and A and the least blood group was AB.

**Table-1: Frequency of ABO Blood Grouping**

Sl. No	Blood group	Number of Subjects	Expressed in %
1	O	10023	40.09
2	A	6393	25.57
3	B	7447	29.79
4	AB	1137	4.55

**Table-2: Rh Phenotype**

Sl. No	Rh Positive (%)	Rh Negative (%)
1	94.69	5.13

## DISCUSSION

The lack of detailed data on ABO and Rh blood groups distribution in Tamilnadu and Pondicherry make this study unique and offered the opportunity to have knowledge on ABO blood groups distribution. The collected data on blood group system can be used for transfusion of blood and blood products, organ transplantation, development of legal medicine and anthropological study. ABO Blood groups were determined with simple and classic slide method. The simplicity of the method has provided the screening of blood groups in large number of samples in a short period of time. Though other methods of blood grouping like test tube and microplate methods are superior over slide method but not suitable for large number of samples in rural setup. A total of 25000 blood samples were observed for ABO and Rh blood grouping. Table 1 and 2 shows the frequency of ABO and Rh phenotypes among the samples studied. Knowledge of frequency of ABO and Rh blood groups is important for management of blood bank inventory and transfusion services to the needy patients. Apart from transfusion service, knowledge on ABO and Rh blood groups are useful in population genetic studies, researching population migration patterns as well as resolving certain medicolegal issues particularly

disputed parentage and preventive measures against the diseases which are associated with different blood groups [3-4]. The data generated in the present study will be useful to health planners to face the future health challenges in the region.

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