

## Importance of ABO Blood Grouping in the Era of DNA Analysis - A Case solved by ABO Blood Grouping Method

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### Abstract

In this case Accused persons raped the Victim girl, but the victim girl washed all her cloths and place of crime, therefore no Semen was detected on any of the exhibits, blood stains were also washed off. There was hardly any chance of getting blood group. In spite of that careful sampling of proper blood stains and careful analysis resulted in conclusive blood grouping. The blood group, found on the clothes of Accused matched with that of the clothes of Victim girl. Though DNA analysis is full proof technique absence of nuclear material negates its superiority. Sometimes traditional ABO grouping also becomes effective tool in such cases.

**Keywords:** Blood stains; Conclusive blood grouping; Blood group; Washed off

- Potassium Hydroxide
- Phenolphthalein
- Zinc Dust

### Introduction

The ABO blood antigens were discovered at the beginning of the last century [1]. The biochemical, molecular-biological and genetic nature of the ABH and related antigens is now quite well characterized and it can be said that they are involved in onco- and onto-developmental and/or cell recognition phenomena [2]. In the forensic science field the ABO system has been a major focus, since the record of this blood system is a very prevalent one and A, B and H antigens on erythrocytes are also associated with other cells and tissues throughout the body and are known to be considerably stable to the violent conditions such as heating or drying [3,4]. In this presentation we review the merits and demerits of the ABO blood-grouping methods utilized and developed in our units during the past three decades, and discuss the biological significance of the ABH and its related antigens on basis of the data showing the distribution of these antigens in the animal organs containing those from human.

### Brief Facts

The victim girl was raped in her own home by two accused and both of them threatened the victim girl and forced her to hide the facts therefore the victim washed all her cloths and place of offence. On the next day one of the accused, again raped the victim girl in her own home, this time also victim washed all her cloths and place of offence due to threatening by accused, but this time victim lodged the complaint with the help of her aunt against both accused and the accused are booked under u/s of IPC 376 and POCSO Act 2012 u/s [4].

### Methods and Chemicals

#### For Kastle-Mayer test

- Hydrogen Peroxide
- Absolute Alcohol

#### For species origin determination

- Agarose Media (1% w/v)
- Tank Buffer (Tris Buffer)
- Anti-Human Serum
- Distilled water

#### For A, B, O blood grouping

- Commercial Monoclonal Antibodies (Tulip Diagnostics)
- Fresh Human Cells (Sir J.J. Group Hospital)

Detection of blood was done by using Kastle Mayer reagent test. After detection the collected blood stains were analyzed for origin of species using Cross over electrophoresis (Electrapage -100) technique at 230mv, which gave positive results for anti-Human serum. The blood stains were further analyzed for A, B, O grouping using absorption and elution technique. The stains were allowed to absorb anti-Human serum (Monoclonal Antibodies) over night at about 10°C. After washing the blood stains with saline water fresh human cells were added and elution carried out by incubating it at 56°C for 10 minutes.

### Results of Analysis

After analysing, it was found that blood stains collected from the clothes of the victim and the accused were of blood group AB.

### Interpretation and Opinion

Though the blood stains were washed, but antigenicity of the cells retained on the fibers of the cloths, that resulted in conclusive blood grouping.

## Discussion

Washing of cloths or any biological evidence results in loss of cells and antigenicity and it is very difficult to conclude any blood group. But the careful sampling of blood stains helped us to conclude the case. Though the blood stains were washed antigenicity on the surface of the cell retained there. As there was absence of nuclear material DNA Analysis was not possible in this case. But the conviction was facilitated by ABO blood grouping method.

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