

Forensic Analysis of Salivary Hemagglutinins From The Samples of Different Populations of Chandigarh

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Abstract

Saliva is a type of biological evidence that can be encountered on materials like cups, cigarette butts, human bodies and other eatables etc. in various types of crimes like sexual assault cases, murder cases, rape cases etc. Analysis of saliva samples can provide us crucial information like excluding the suspected persons, identification of persons. The purpose of present study is the detection of hemagglutinins in saliva samples from north-western population of Chandigarh. A total 60 saliva sample were collected and examined microscopically for the presence or absence of clumping using indicator cells, giving results of blood groups and secretor status and non-secretor status. Out analyzed samples, 90% population has shown secretor status and 10% has shown non-secretor status. Out of this 90%, 46.2% population samples showed salivary hemagglutination while 53.8% populations don't showed salivary hemagglutination. This study can help to narrow down the area of search related to crimes in Chandigarh, where saliva is encountered as evidence.

Keywords: salivary hemagglutinin, forensic serology, ABO blood grouping, secretor and non-secretor status.

Introduction

Serology is the study and examination of body fluids that is used in forensic science because it separates the body fluids which excreted by assaulter or murderer in various criminal offences. These offences are sexual assault, murder, suicide all of them contain body fluids secretion which is forensically important. When body fluids found in the crime scene the forensic scientist perform various test on body fluids in order to identify the individual who secrete these body fluids. Saliva is a fluid which is secreted by salivary gland. Human saliva contains 99.5% water and also contain some electrolytes (sodium, calcium, and phosphate), mucus, antibacterial compounds and various enzymes. It contain salivary amylase enzyme which breakdown starch into sugar molecule. Glycoproteins are molecules that contain sugar or carbohydrate. Some glycoproteins i.e. mucins are present in saliva. Salivary glycoprotein contain ABH blood group antigens indicate hemagglutinins from saliva. Due to ABH blood antigen, the secretor and non-secretor status has been detected.

The saliva was analyzed for the detection of salivary hemagglutinin in central Indian population by Ashish Badiya et al. the 340 Maharashtrian adult have been analyzed for the presence of salivary hemagglutinins. Similarly, Amit Chauhan and Meeta Gera worked on the study of cogitation on salivate agglutinin on jaats of northern population of India. They analyzed 130 saliva samples from northern population of India. Since many investigator confirmed that salivary hemagglutinins have a blood group antigen which helpful in crime scene, if the saliva is encountered as evidence in crime scene.

Material and Method

Collection of the sample:

A total of 60 saliva samples were collected from different population of Chandigarh. Maximum saliva were collected from west area of Chandigarh and some samples are collected from north area of Chandigarh. The samples were collected as random basis. The saliva samples were collected by asking the individuals to rinse their mouth, to remove trace of eatable material with water. Then, sterile cotton was inserted beneath the tongue for 10minutes. After that, cotton swabs were squeezed in centrifuged vials which were further stored in deep freezer at - 20°C until their analysis.

Analysis:

Firstly, saliva samples were removed from deep freezer and kept at room temperature for thawing. Side by side indicator cells of blood group A and B were prepared by centrifugation of blood at 3000rpm for 2-3 minutes and washed with normal saline. These steps were carried out 2-3 times. After thawing, the saliva samples were centrifuged at 5000rpm for 15minutes and put in cavity tiles marked as A and B and indicator cells of A and B blood group were added and after taking both on two different glass slides examined microscopically for presence or absence of clumping.

Result and Discussion

The total 60 saliva sample were examined by the detection of hemagglutinins through microscopy. Out of 60 samples 14 samples have unknown blood group sample and 47 saliva sample were known blood group. Out of these, 54 samples have secretor because the samples shows agglutination in A indicator cell, B indicator cell and in both indicator cell and 6 sample have non- secretor because the sample did not show agglutination in any indicator cell. From secretor sample, 15 saliva sample gave positive result of hemagglutination and 30 samples gave negative results and 10 subjects were unaware about their blood group so their samples were not included under the category of positive or negative result.

Conclusion:

In the present study, an attempt has been made to detect secretor status and salivary hemagglutinins in the north-western population of Chandigarh with a simple and easy method. Out of all the 60 subjects, 90% of the population has been found to be secretor status while 10% of the population is of non-secretor status. Out of this 90% population, in 46.2% population, salivary hemagglutinins were detected and in 55.5% population, hemagglutinins were not found and this study can help to narrow down the area of search related to crimes where saliva is encountered as evidence in the area of Chandigarh.

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