

# Development of Rapid Identification System for Identification of Gram-Positive Cocci by Indigenously Developed Kit

Mahnoor Pervaiz\*, Mehmooda Kazmi

Department of Microbiology, Jinnah University for Women, Karachi, Pakistan

## ABSTRACT

Gram-positive cocci are of great importance in medical and health sciences. Genera belongs to gram-positive cocci are threat for life as they become resistant to many antibiotics. Staphylococcus and Streptococcus causes numerous infections that can be fatal for other living organisms as they are not treatable due to their resistivity to antibiotics. Conventional methods used for their identification are more time consuming and expensive. During this study we worked on development of a rapid identification system for gram-positive cocci by indigenous developed kit. Rapid identification system for gram-positive cocci (Staphylococcus and Streptococcus) by indigenously developed kit will be a huge giving in the field of health sciences. This system gives accurate results in less time. This study helps to evaluate uses of this kit for identification of species of Staphylococcus and Streptococcus.

**Keywords:** Conventional, Indigenous, Resistant, Antibiotics, Therapeutic, Fermentation.

## INTRODUCTION

Gram-positive cocci are becoming progressively more implicated in human diseases and resistant to many antibiotics and due to this reason rapid identification of bacteria is very crucial in microbiology and pathology laboratories. Gram-positive bacteria are of major concern as they become threat to life because they can cause serious illness and health problems. Multidrug-resistant (MDR) like methicillin resistant *S. aureus* (MRSA),  $\beta$ -lactamase resistant *S. pneumonia* is gram-positive cocci and facilitate resistant to many antibiotics.

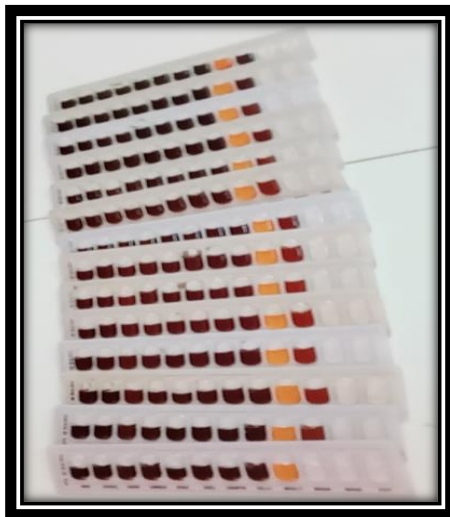
Basically two medically important genera of gram-positive cocci, Staphylococcus and Streptococcus are of major concern because of their pathogenicity and therapeutic significance. Conventional methods such as morphological characteristics, biochemical tests and sub-atomic techniques are used for identification of gram-positive cocci. These all techniques consume more time and very expensive. Except these reasons there is always a probability of contamination in these techniques because of using abundance of glass wares. On the further hand rapid identification of medically significant gram-positive cocci give accurate results in reduce time by using indigenously developed kit method.

During this study, indigenously developed kit was used for rapid identification of strains of Staphylococcus and Streptococcus. This indigenously developed kit use a combination of sugar fermentation by using new formulated sugars and enzyme detection by using arginine and urea. This study had been done to propose development of rapid identification system for gram-positive cocci and to appraise the uses of developed kit in various fields of health sciences.

## METHODOLOGY

14 known cultures of medically important gram-positive cocci (Staphylococcus and Streptococcus) have been collected from local pathology lab. Microscopy was analyzed parallel with conventional methods. For rapid identification of gram-positive cocci we took 14 sterile strips of indigenously developed kit. Each strip consists of 10 tests. We marked the ampoules by labeling them with sugars, urea and arginine. Then charged the strips

with formulated sugars, urea and arginine into their respective labeled ampoules. Place the strips for drying into vacuum oven for 2-3 hours. We added pure cultures in saline separately to make culture suspension. After 2 hours, we added culture suspension in each strip and covered the strips. Then we placed the strips into incubator at 37°C for few hours. After few hours results were shown by changing colors of sugar, urea and arginine.



## RESULTS

Results after incubation are easily interpreted by color change. The sugar fermentation test identified the organism on the basis of pH indicator color change. Change in coloration of arginine and urea confirms the presence of enzyme because enzyme reacted with added indicator. These all results are compared with reference charts so we find that indigenously developed kit give results in less time with accuracy as compared to conventional methods. Each strain of Staphylococcus and Streptococcus showed different results on the basis of their fermentative pathway of sugar.

## CONCLUSION

Rapid identification of gram-positive cocci by indigenously developed kit is a new developing technique that helps in fight against those medically important gram-positive cocci that are leading cause of health issues. Indigenously developed kit is easy to use and give rapid results for identification of microorganisms. If we will work on this kit for more cultures so we can identify the bacteria rapidly and prevent them to become resistant to antibiotics.

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