



ISSN: 0976-3031

Available Online at <http://www.recentscientific.com>

International Journal of Recent Scientific Research  
Vol. 7, Issue, 10, pp. 13585-13586, October, 2016

**International Journal of  
Recent Scientific  
Research**

## Research Article

### GEL CARD TECHNIQUE- A NEW METHOD OF CROSS-MATCHING OF BLOOD

**Hitesh Kumar K., Sangeeta G., Venkat S and Hayath Sikinder M**

Department of Transfusion Medicine, Kamineni Institute of Medical Sciences, Narketpally,  
Nalgonda Dist., T.S., India.-508 254

#### ARTICLE INFO

##### Article History:

Received 20<sup>th</sup> June, 2016

Received in revised form 29<sup>th</sup> August, 2016

Accepted 30<sup>th</sup> September, 2016

Published online 28<sup>th</sup> October, 2016

##### Key Words:

Gel Card, Crossmatching, Blood

#### ABSTRACT

Crossmatching of blood is routinely done using tube method. This method involves washing steps and takes 90 min (1½ hour). The gel card method introduced by Lappiere et.al is used for crossmatching of blood along with conventional tube method. In gel card method washing steps are not required and the time taken is only 30 min. A comparative study of conventional tube method vs gel card method is performed in 131 cases. The sensitivity and specificity are 100% in both the methods. The advantages and disadvantages of the methods are discussed.

**Copyright © Hitesh Kumar K et al., 2016**, this is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original work is properly cited.

## INTRODUCTION

The major cross-match is performed to minimize the risk of a patient receiving incompatible blood. The tube technique has been the cornerstone of compatibility testing over last 40 years, but the enhanced sensitivity of the gel card technique has made the interpretation of the tests more objective.<sup>4</sup>

To read the relative strength of agglutination correctly in the tube technique, lots of experience & concentration is required. To obtain good results the reaction must be examined by a qualified person within a short span of time, even then sometimes it is difficult to interpret.<sup>1</sup>

In an attempt to overcome this practical difficulty of the tube technique, the gel card micro typing method was introduced by Lappiere and Rigal in 1990.<sup>5</sup> Gel cards are now commercially available.<sup>6</sup> In some European countries, field testing for gel card method began in 1987 & the kit was available by 1988.<sup>5</sup>

The gel card kits are available in USA since 1995. The gel card micro typing system utilizes a sephadex gel to capture agglutinate in a semisolid medium. This enhances the visibility of agglutination compared to the traditional tube technique.<sup>3</sup> The gel test was initially developed to standardize agglutination reactions & to fix agglutinates & to allow a simple and reliable reading.<sup>2</sup>

It consists of Dextran Acrylamide gel particles in a microtube. Red blood cells are centrifuged through gel. The gel acts as a trap. The free RBC'S pellet is seen in the bottom of the tube,

while the agglutinated RBC'S are trapped in the gel for hours.<sup>5</sup> In a gel card 8 micro tubes are embedded in a plastic card for easy handling, testing & reading.

In the present study, cross matching by both conventional tube method and gel card method is attempted for the patients admitted to Kamineni Institute of Medical Sciences, Narketpally.

## MATERIALS AND METHODS

A total of 131 cases are taken for study from 6/9/2015 to 16/12/2015.

All samples are cross matched using standard conventional tube method. In addition, all samples are cross matched using the gel card method.

Both the methods of cross matching are compared for:

1. Time taken
2. Cost
3. Accuracy of the result
4. Assessment of sensitivity & specificity

## OBSERVATIONS AND RESULTS

The highest number of cases studied belonged to O positive blood group.

\*Corresponding author: **Hitesh Kumar K**

Department of Transfusion Medicine, Kamineni Institute of Medical Sciences, Narketpally, Nalgonda Dist., T.S., India.-508 254

**Table 1** Blood group wise distribution of the cases studied

BLOOD GROUP	N=131
A positive	23
A negative	3
B positive	40
B negative	1
AB positive	8
AB negative	0
O positive	52
O negative	4

## CONCLUSION

The results of crossmatching by both methods are comparable. The sensitivity and specificity is 100% by both methods of crossmatching. Gel card method takes only 15-20 min and has no washing steps. Results can be preserved for 3-4 days unlike tube method where results cannot be preserved.

**Table 2** Age wise, Sex wise and Blood group wise analysis of cases studied

Blood group	0-10 years		20-Nov years		21-30 years		31-40 years		41-50 years		> 50 years		Grand Total
	M	F	M	F	M	F	M	F	M	F	M	F	
A+ve			2	4	1	3	1	2	3	1	4	2	23
A -ve						1					2		3
B+ve	1	4	2	6	4	9	2		2		8	2	40
B-ve											1		1
AB+ve		1				2	2			1		2	8
AB-ve													0
O+ve		1	1	4	3	8	3	8	2	6	7	9	52
O-ve	1			1							1	1	4
	2	6	5	15	8	23	8	10	7	8	23	16	131

## DISCUSSION

Tube method of cross matching is a labourious & time-consuming method. Tubes must be read one by one & manipulated by hand. There are 6 centrifugal steps in the tube cross matching method. Tube method takes 60-90 min. The sensitivity & specificity depend on the technicians' techniques, how the tubes are handled and read.

These can be overcome by gel card method. It has the advantages of being sensitive & easy to perform. A reagent can be added directly to the gel & the antiglobulin test can be performed without any washing of red blood cells. The interpretation of results is clear & simple. The differences between positive and negative results are distinct. The technique is rapid to perform, reliable procedure without controls. There is decreased technique dependence. The gel card method takes only 15-20 min for testing. Gel cards can be read with accuracy for at least 24 hrs. The positive predictive value is 100% like conventional method.

### Summary

In the present study, undertaken from 6/9/13 to 30/10/13, 131 cases are analysed using both conventional tube method and gel card method, it is observed that gel card method is less time-consuming, has sensitivity and specificity is 100%. But gel card method is costly due requirement of costly and separate incubator and centrifuge and price of the kit (400 tests – Rs 12,000).

## References

1. Col D Swarup, Brig PS Dhot, Lt. Col. J. Kotwal, Lt. Col. AK Verma. Comparative study of blood cross matching using conventional tube & gel method. *MJAFI*, 2008; 64(2):129-230.
2. Kaur R, Kakkar N, Dhanoa J. Use of Gel based Diamed-ID microtyping system for cross matching enhances sensitivity. *Indian J Pathol Microbiol*. 2003; 46:617-620.
3. Vanamala Alwar, A.M Shanthala Devi, S.Sitalakshmi, R.K.Karuna. Evaluation of the use of Gel card system for assessment of direct coombs test: Weighing pros and cons. *Indian J Hematol Blood Transfus*. 2012; 28(1):15-18.
4. Bromilow, I.E, Adams, K.E, Hope E.J, Eggington J.A & Duguid J.K.M. Evaluation of the ID-gel test for antibody screening & identification. *Transfusion medicine*. 1991;1:159-161
5. Lapierre Y and Rigal D. The gel test: A new way to detect red cell antigen-antibody reactions; *Transfusion*. 1990;30:109-113
6. Jennings E.R, Hindmarsh C, Renaud M. The significance of the minor cross match. *Am J clin Pathol*. 1958;30:302

\*\*\*\*\*

### How to cite this article:

Hitesh Kumar K et al. 2016, Gel Card Technique- A New Method of Cross-Matching of Blood. *Int J Recent Sci Res*. 7(10), pp. 13585-13586.