

Blood Grouping With ABD PAD- Efficacy And Comparison With Standard Method – A Pilot Study

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Abstract: Background: In transfusion service, it is very important to carry out blood group with perfection. Blood grouping is a fast and easy way to ensure that you receive the right kind of blood for right patient. There are many methods we use for blood grouping like Slide method, test tube method, column agglutination method and erythrocyte magnetic technique. Test tube method is gold standard method for blood grouping. We need to verify donor blood group in blood bank or at camp site, for patients at bed side, at the time of issue of blood unit or at the time of dire emergency so to verify the blood group in Blood centres we require the results of blood grouping urgently. ABD PAD® is a new device for the quick confirmation of the ABO blood group. Materials And Methods: In this Pilot study, 200 samples were taken of which 100 were donor samples and 100 were patient samples. Blood grouping was performed on the ABD PAD, and results were compared with conventional tube technique and automate platform, Qwalys 3 (Diagast) EMT technique. Results: All 200 tests performed on the ABD PAD were concordant with other standard methods, namely the Test Tube technique and automated platform, Qwalys 3 (Diagast). The results of ABD PAD were quicker (within 30 seconds) and easy to interpret. Discussion: The manual confirmation of the ABO group and RH- rhesus is a repetitive and time consuming task. It requires following a procedure handling several reagents. In this context, the ABD pad is a ready to use device using the latex technology M- TRAP, facilitating the procedure intended for the confirmation of ABO/Rh. The only drawback is that we are not able to perform reverse grouping. Conclusion: ABD PAD is very useful for blood grouping in donors in the blood bank as well as in outdoor blood donation camp and at the time of issue of blood unit when we want to re-check the blood group of the issue bag. It is easy to interpret, fast, reliable and results are comparable with standard methods. [Shah M Natl J Integr Res Med, 2021; 12(1): 42-45]

Key Words: ABD Pad, ABO RH Blood grouping, M-trap technology

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Introduction: Blood safety has become a major challenge. Blood group confirmation is an important part of the transfusion chain. Blood typing is done prior to blood transfusion or donation. Blood typing is done to ensure that patient receives the right kind of blood during surgery or after an injury. For blood grouping slide and tube method was used before automated procedure was invented. It is time consuming and slide method is also very crude so for patient safety for quick confirmation of blood group, a new device ABD PAD® (Figure -1) is launched.

ABD PAD® is a new device for the confirmation of the ABO blood group and the RH 'D' Status. ABD Pad is a Ready-to-use device, Ergonomic design, Easy identification of the test And Easy reading of results. The kit uses M-TRAP (Membrane TRAP) technology based on the immobilization of antibodies covalently bounded to a porous membrane.

Each ABD PAD® device contains 30 anti-A and anti-B wells dried on a membrane. This is a comparative pilot study in which samples blood group were compared to standard method like test tube technique and EMT (erythrocyte magnetic technique). Figure -1 Showing ABD PAD® Plate.

Figure 1: ABD PAD® Plate



Material & Methods : Following consumables are used for blood grouping. ABD PAD® (Diagast) Pad Buffer. Micro Tips (Thermo scientific -2 to 4 µl). EDTA Sample 2 to 4 µl (JK Diagnostics)

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ABD PAD®: ABD PAD® device is prepared with reagents containing monoclonal antibodies. These monoclonal antibodies are murine or human origin. A, B and D specificities are

indicated above the respective wells. Table-1 Shows the details of ABD PAD® reagent, clones, type, origin and reactive zone color.

Table 1: The Details Of ABD PAD® Reagent, Clones, Type, Origin And Reactive Zone Color

Reagent	Clones	Type	Origin	Reactive zone color
anti-A (ABO1)	9113D10	IgM	Murine	Blue
anti-B (ABO2)	9621A8	IgM	Murine	Yellow
anti-D (RH1)	P3x61	IgM	Human	Green

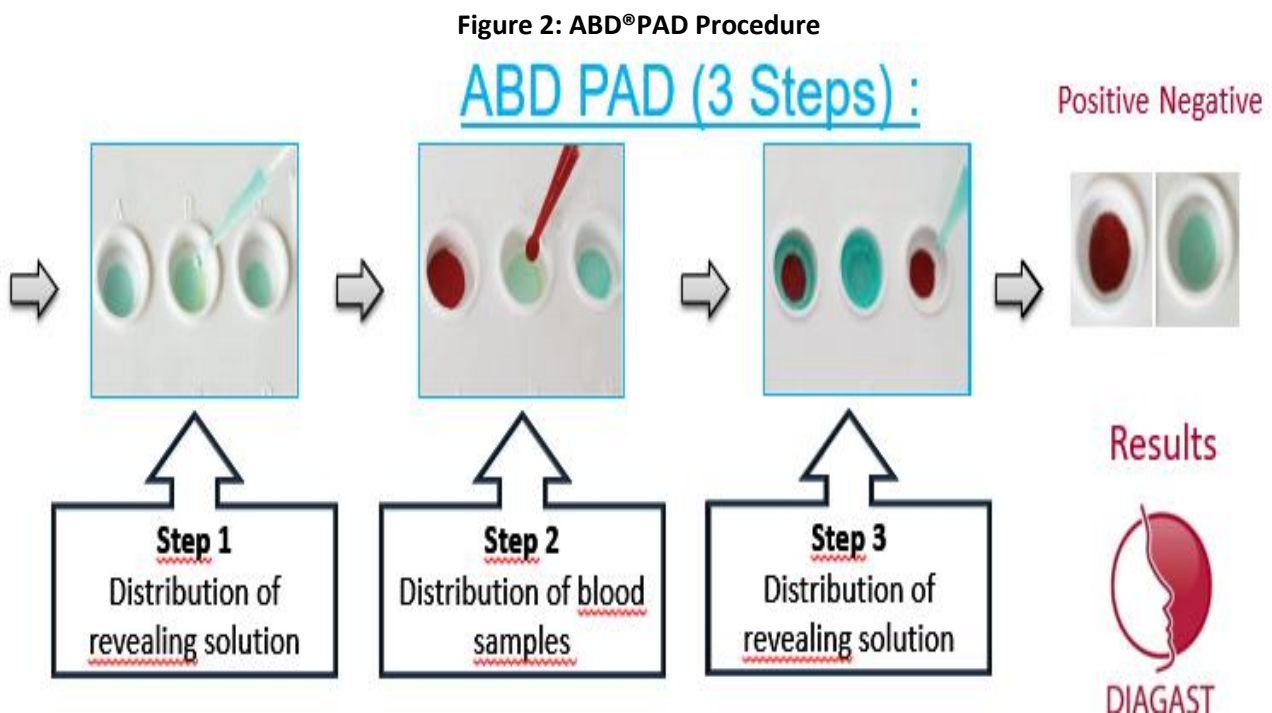
Storage Of Device: The devices have to be stored between 2°C and 25°C. Not be used beyond their expiry date. Not be used if the bag is damaged. Can be used for 30 days at room temperature

Precautions To Be Taken: Wear gloves, goggles to handle human samples with care. Elimination and disinfection conditions comply. Do not use a damaged device.

Procedure: 1. Activation of reactive zones -Place one drop (approximately 50µl) of PAD Buffer on the reactive zone so it turns completely to green. 2. Deposit of blood sample- Place a small drop

(approximately 25µl) of the blood sample on each reactive zone. 3. Revelation of the reaction-Place a 250µl of PAD Buffer and read the results. Read the results immediately after revelation of the reactions.

Figure-2 Shows ABD®PAD Procedure: it includes distribution of revealing solution (pad buffer), distribution of blood samples and then again distribution of revealing solution and lastly interpretation of result. Positive result shows development of red colour while negative result remains as its green.



PAD Buffer: PAD Buffer are in-vitro diagnostic medical devices (IVDMD) for professional use. They are used in combination with the PAD® devices as a reagent activation and revelation buffer for the results. This technique is based on an immune blotting test using spots. The tested red blood cells, carrying an antigen, interact with

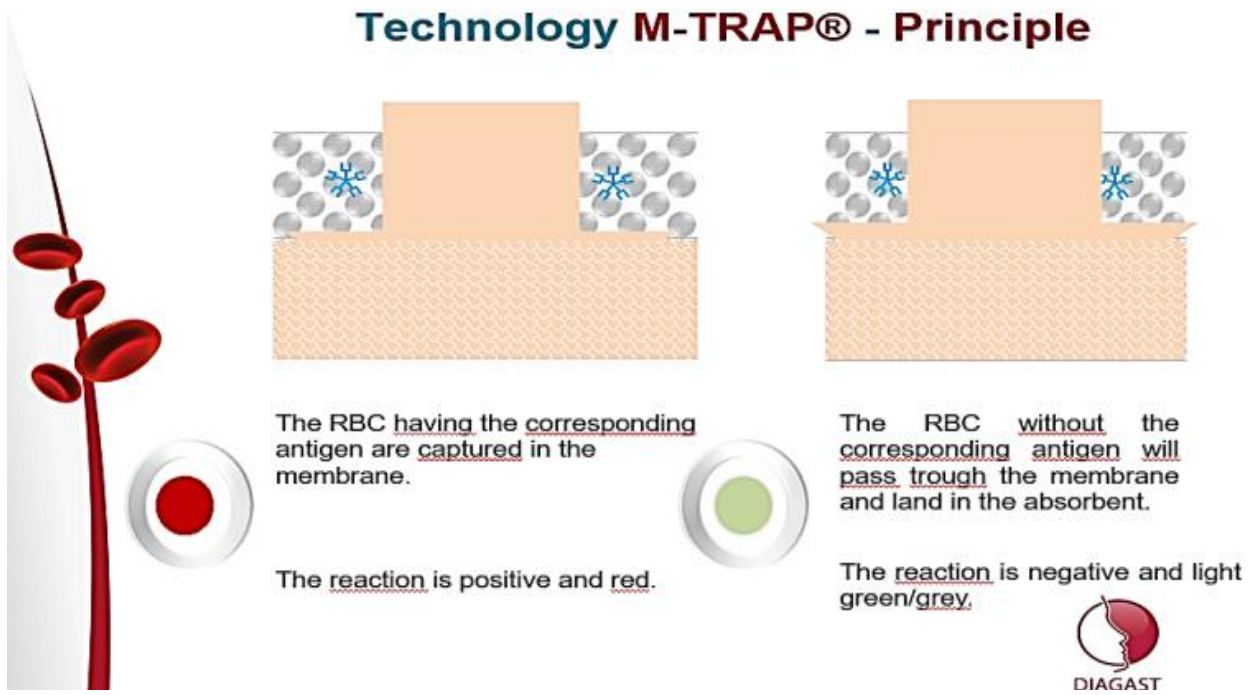
the corresponding antibodies, revealing a red colored spot. The erythrocytes which do not carry the antigen do not interact with the antibodies and cross the membrane. The spot will appear light green or white.

M-TRAP®Technology: M-TRAP® is a patented proprietary technology by DIAGAST³. With this

technology it is possible to detect, from a whole blood sample or from an erythrocyte concentrate, a reaction between an erythrocyte antigen and an antibody directed specifically against this antigen.² Figure-3 shows Membrane TRAP technology on which ABD PAD works.

*Micro tips (5-10 µl), * EDTA Sample (2 ml), Blood collected on anticoagulant: EDTA, heparin or citrate, stored between +2°C and +8°C.

Figure 3: Membrane TRAP Technology On Which ABD PAD Works



All Manufacturer’s instructions were followed. In this Pilot study 200 samples, were taken of which 100 were donor samples (include voluntary non remunerated and replacement donors) and 100 were patient samples (patient admitted in tertiary care hospital). Blood grouping was performed on the ABD PAD, and results were compared with conventional tube technique and automated platform, Qwalys 3 (Diagast) EMT

technique¹. The underlying figure shows the results of the blood grouping data of donors and patients in our institute, performed on ABD PAD®. All 200 tests performed on the ABD PAD® were concordant with other validated methods, namely the tube technique and automated platform, Qwalys (Diagast). Chart-1 Shows number of donor and patient sample performed on ABD PAD® device.

Chart 1: Donor And Sample Performed on ABD PAD® device

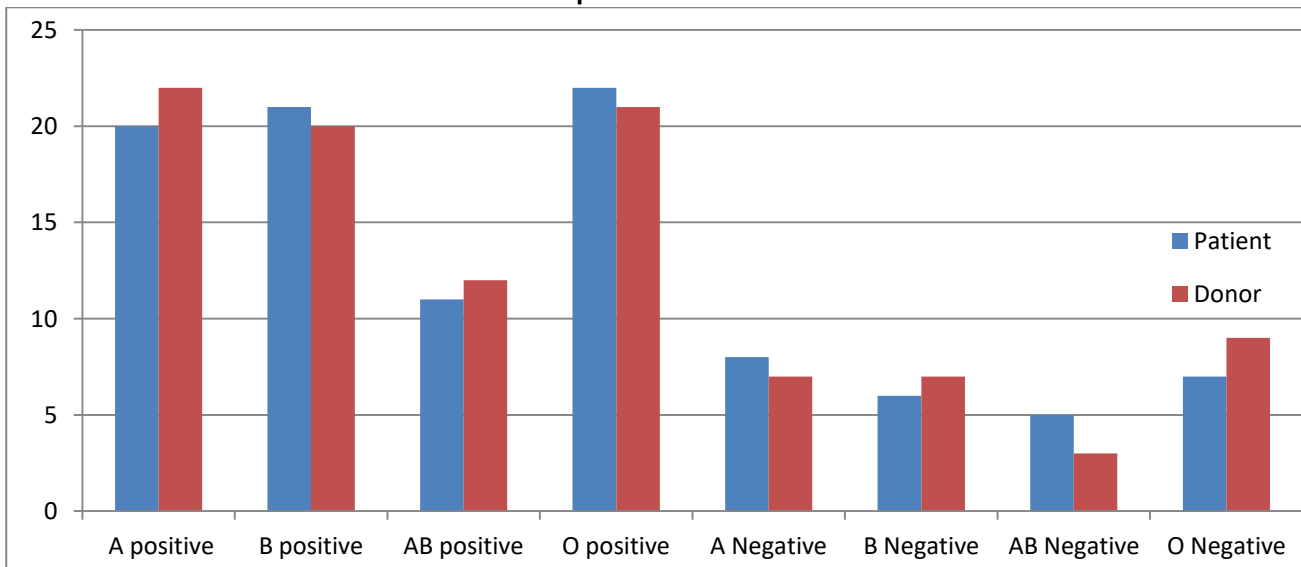
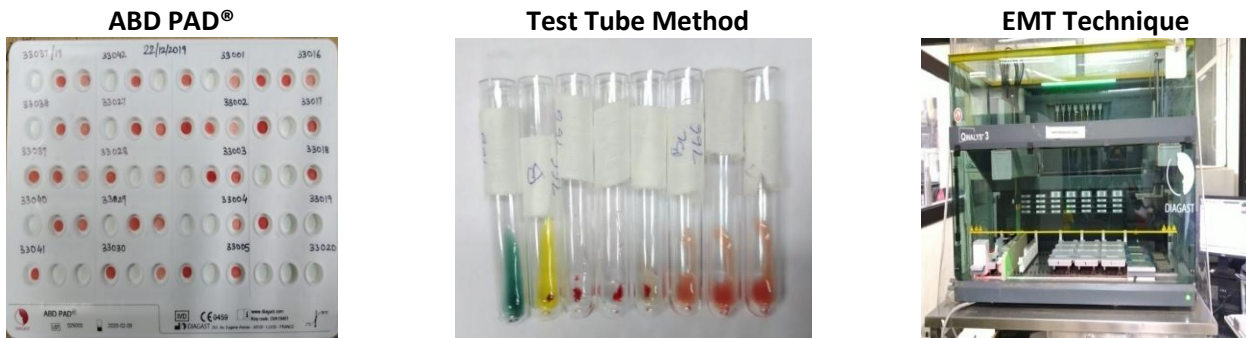


Figure-4 Shows Different Method Of Blood Grouping Like Test Tube Method (Gold Standard) And Erythrocyte Magnetic Technique (Fully Automated).



Discussion: ABD PAD® is a new device used all over the world; It shows 100 % concordance result with other standard method of blood

grouping. Table: 2 Shows the data of blood group on ABD PAD and comparison with other standard method all over world [4,5,6].

Table 2: Blood Group On ABD PAD And Comparison With Other Standard Method All Over World

Country	ABD PAD	Test Tube Method	EMT Technique(Diagast)
Ahmedabad (dept IHBT)	200	100 % concordance	100 % concordance
Vietnam	200	-	100 % concordance
Lille	274	-	100 % concordance
Greece	120	100 % concordance	100 % concordance
Italy	388	100 % concordance	-
Taiwan	427	100 % concordance	-

Advantages: No contamination risk. Clear and colorimetric reactions⁴. Pre-filled/coated monoclonal reagents. Use of blood bag segments, finger prick method. EDTA/CPD/Heparin tubes.

Traceability: results can be registered and recorded. Easily done at Bedside testing as it is handy. Can be performed at Hot & tropical climate. Can be used in Military, Ambulances, Blood centers & Hospitals. The results can be kept for long time(as we can take picture of results).In case of error - A doctor can check/verify the results again.To a limited extent detection of subgroups also possible.

Limitations: The few limitations are Reverse group is not possible, grading of agglutination is not possible and it is costly.

Conclusion: ABD PAD® is very useful for blood grouping in donors in the blood bank as well as in outdoor blood donation camp and at the time of issue of blood unit when we want to recheck the blood group of the issue bag. It is 100% concordance compared to the expected results. It is easy to interpret, fast, reliable and very ergonomic method that saves time compared to the technique used routinely.

References:

1. M.amouchus, b.gourou: evaluation of new blood group device abd pad
2. Julein herlem,odilefontaine: evaluation of m-trap technology in abo/rh blood grouping with abd pad device
3. Villa MA,RevelliN,Scognamiglio S, Manazza A, Prati D- ABD PAD : Evaluation Of A New Manual Abo/Rh Blood Grouping Method
4. Chiung-chen, Tai-cheng Lee, Fang-yeh Chu-ABDPAD Evaluation in 2 sites in Taiwan: shin Kong Wu Ho-Su Memorial Hospital and Far Eastern Memorial hospital
5. Phan Nguyen Thanh van, MD Tran Hoa Chuong: manual blood group confirmation in less than thirty seconds
6. T.Linda,AChristovassii,C.Papanikolaou,H.Gerov angeli: manual blood grouping confirmation with the ABD PAD in Greece

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