MDMULTICARD®- A NEW MEMBER FOR THE IMMUNOHEMATOLOGY TOOLBOX

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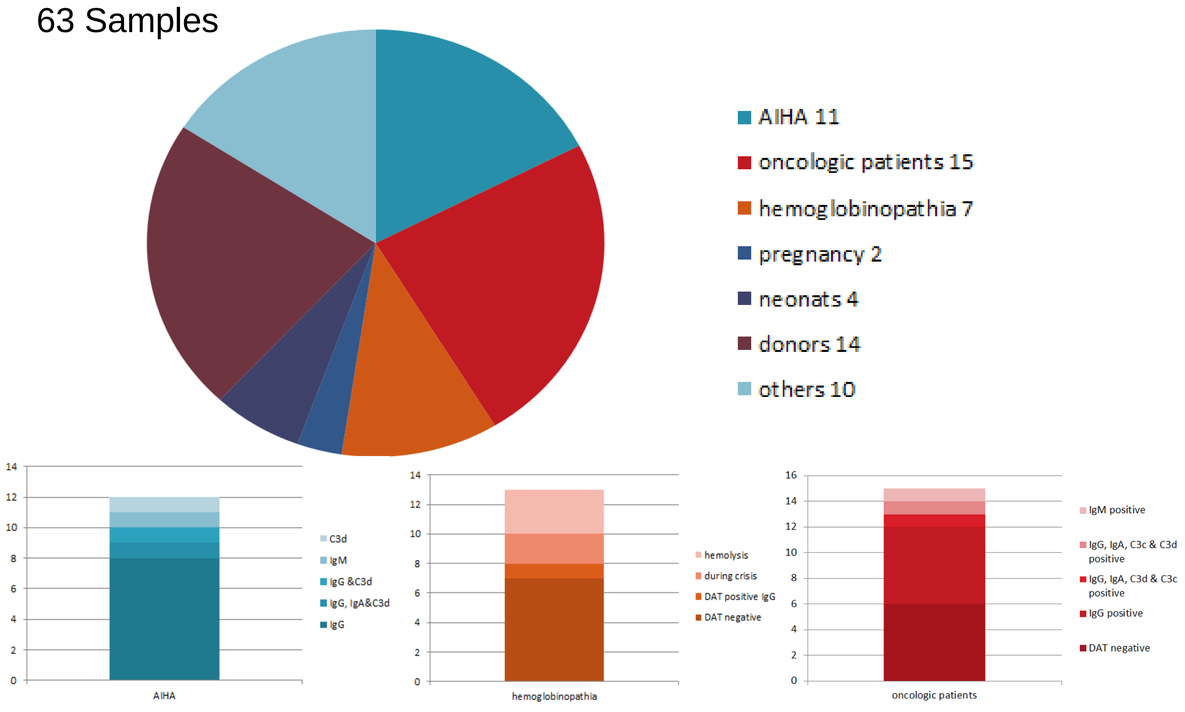
Background

The MDmulticard® Basic Extended Phenotype (Medion Grifols Diagnostics, Duedingen, CH) was launched in September 2016 and allows simultaneous typing for Jk^a, Jk^b, Fy^a, Fy^b, S, s antigens using lateral flow technique.[1]

Aims

In order to implement the MDmulticard® as an additional analytic platform we examined a series of samples taken from patients suffering from clinical conditions known to hamper serological red blood cell (RBC) antigen typing.

63 Samples



Methods

Samples of patients suffering from positive DAT including warm and cold autoimmune hemolysis (AIHA) and sepsis, sickle cell disease, paraproteinemia due to Multiple Myeloma or Morbus Waldenström and samples of newborns as well as samples of healthy blood donors (three with known weak Fy^x) were assessed by MDmulticard® Basic Extended Phenotype. [2]
The results were compared with the findings by alternative test methods, either by standard serology typing (gel-card on Erytra®, Medion Grifols, Duedingen, CH or BioRad, Cressier, CH) or by commercial molecular typing (inno-train GmbH, Kronberg i. T., D).

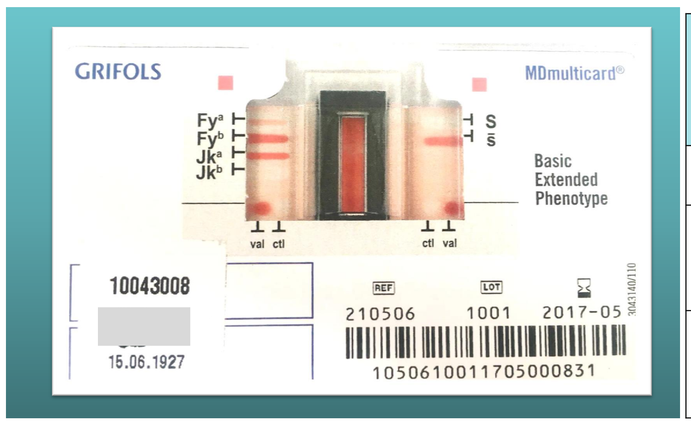


Figure 1: Sample of a patient with AIHA, DAT IgG 4+

Method	Result
PCR	Fy^a-,Fy^b+/Jk^a+,Jk^b-/S-,s+
MDmulticard®	Fy^a-,Fy^b+/Jk^a+,Jk^b-/S-,s+

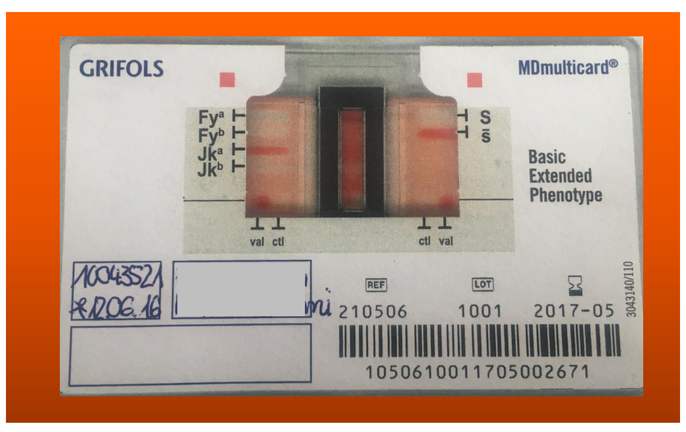


Figure 2: Sample of a patient with sicklecell disease during crisis, DAT IgG 1+

Method	Result
PCR	Fy^a-,Fy^b-/Jk^a+,Jk^b-/S-,s+
MDmulticard®	Fy^a-,Fy^b-/Jk^a+,Jk^b-/S-,s+

Results

The MDmulticard® was easy to handle and provided rapid results (in average 9 minutes from test start) making the method suitable for emergency applications. In general, the results were confirmed by alternative methods or known pre-values.
Two of known Fy^a negative samples showed false positive reactions by MDmulticard® due to the patients' strongly positive DAT (3+ and 4+).
One sample delivered a weak Jk^b positive result by MDmulticard® although the patient was known to be Jk^b negative by PCR. Clinical evaluation revealed recent transfusion of Jk^b positive RBC concentrates. In two IgM-DAT positive samples, the predicted phenotype by PCR was accurately diagnosed by MDmulticard® upon washing the patient's RBCs with NaCl 0.9%.[3] A similar observation was made with cord blood cells. Another sample from a patient with severe cold AIHA needed to be washed with warm NaCl 0.9%.

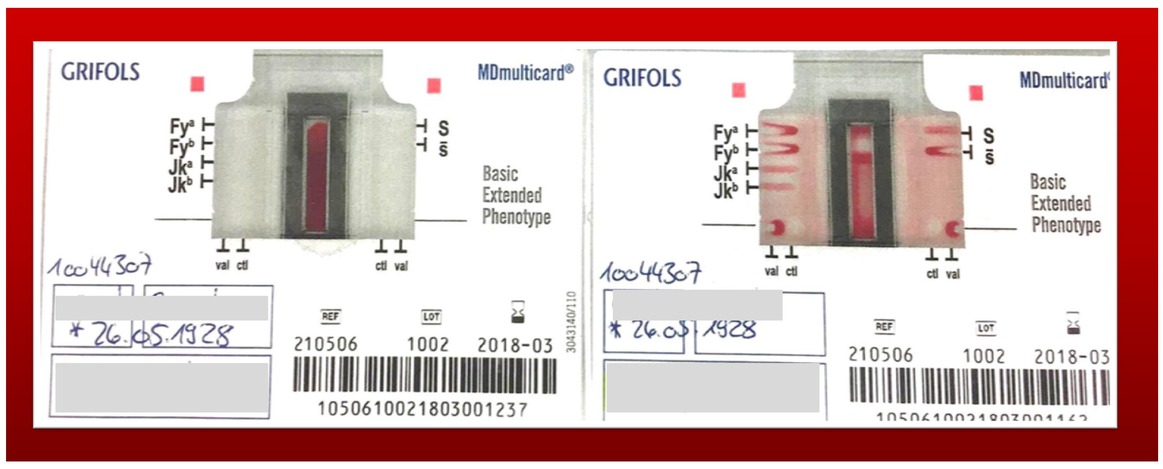


Figure 3: Sample of a patient with Multiple Myeloma, DAT IgM 1+

Method	Result	
	normal	washed RBC with NaCl 0.9%
PCR	Fy^a+,Fy^b+/Jk^a+,Jk^b+/S+,s+	
MDmulticard®	not interpreatable	Fy^a+,Fy^b+/Jk^a+,Jk^b+/S+,s+

Summary

MDmulticard® allows reliable RBC typing even of DAT positive samples. MDmulticard® may be applied to samples of patients suffering from clinical conditions such as sickle cell disease, AIHA or paraproteinemia impairing standard serological typing. In pre-transfused patients or such with a strongly positive DAT, the distinct positive reaction by MDmulticard® allows to differentiate between false positive reactions and inherited antigen positive RBCs. For emergency situations, the MDmulticard® proves to provide rapid and reliable antigen typing which allows transfusing the patient with phenotype compatible RBC concentrates.

Figure 4: Sample of a patient before and after incompatible transfusion

Method	Result	
	before transfusion	after transfusion
MDmulticard®	Fy^a+,Fy^b-/Jk^a+,Jk^b-/S-,s+	mixedfield reactions in Fy^b

References

[1] Herziger et al., 2017
[2] Weinstock et al., 2017
[3] Metaxas -Bühler,1986

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