R- FACT Study:
Risk Factors for Alloimmunization to red blood Cell Transfusion

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What do we know?

-Incidence of alloantibody formation 1- 6% in single transfused

-up to 30 % in poly- transfused patients

-serious clinical problems and logistic problems.

Antigen prevalence in donors & antibody frequencies

Antigen (%) Caucasians		Antibody (%)	
E	29	Anti E	34.5
K	9	Anti K	24.9
c	80	Anti c	8.5
Jk^A	77	Jk^A	7.9
Fy^a	66	Anti Fy^a	9.2
C	68	Anti C	6.3
Jk^b	74	Anti Jk^b	2.5
D	85	Anti D	2.5

What could prevent Ab-formation?

- Extended matching
- …an ultimate but complicated and costly solution
- first step: selective matching in high risk patients

What is known so far?

- Bauer et al: Transfusion. 2007 Nov;47(11):2066-71.
- case-control study
- 101 cases developing RBC alloAb and 87 controls
- known risk factors confirmed:
  - female sex (increased risk);
  - lymfoma, leukaemia (lower risk)
- new risk factors (increased risk)
  - diabetes
  - solid tumours

New research Objective

Larger study to study risks or resistance to immunisation by RBC transfusion

a. more detailed clinical, environmental risk factors
b. genetic risk factors

Study design and size

Case Control Study

1000 cases

2000 controls

Multi Centre/ Nationwide study

Cases

1. Previous negatively screened patients
2. Developing a 1st time RBC alloantibodies in the study period
3. With a transfusion history
4. Not allocated for extensively typed RBC transfusions

Source:

large RBC products using hospitals nationwide

Controls

- Transfused patients
- No antibodies
- Matched on hospital and antibody screen period
- Matched on the transfusion exposure

Measurements

1.Patient Medical and Transfusion history:

2. Questionnaire:

vaccination status, previous pregnancies, level of education and current profession

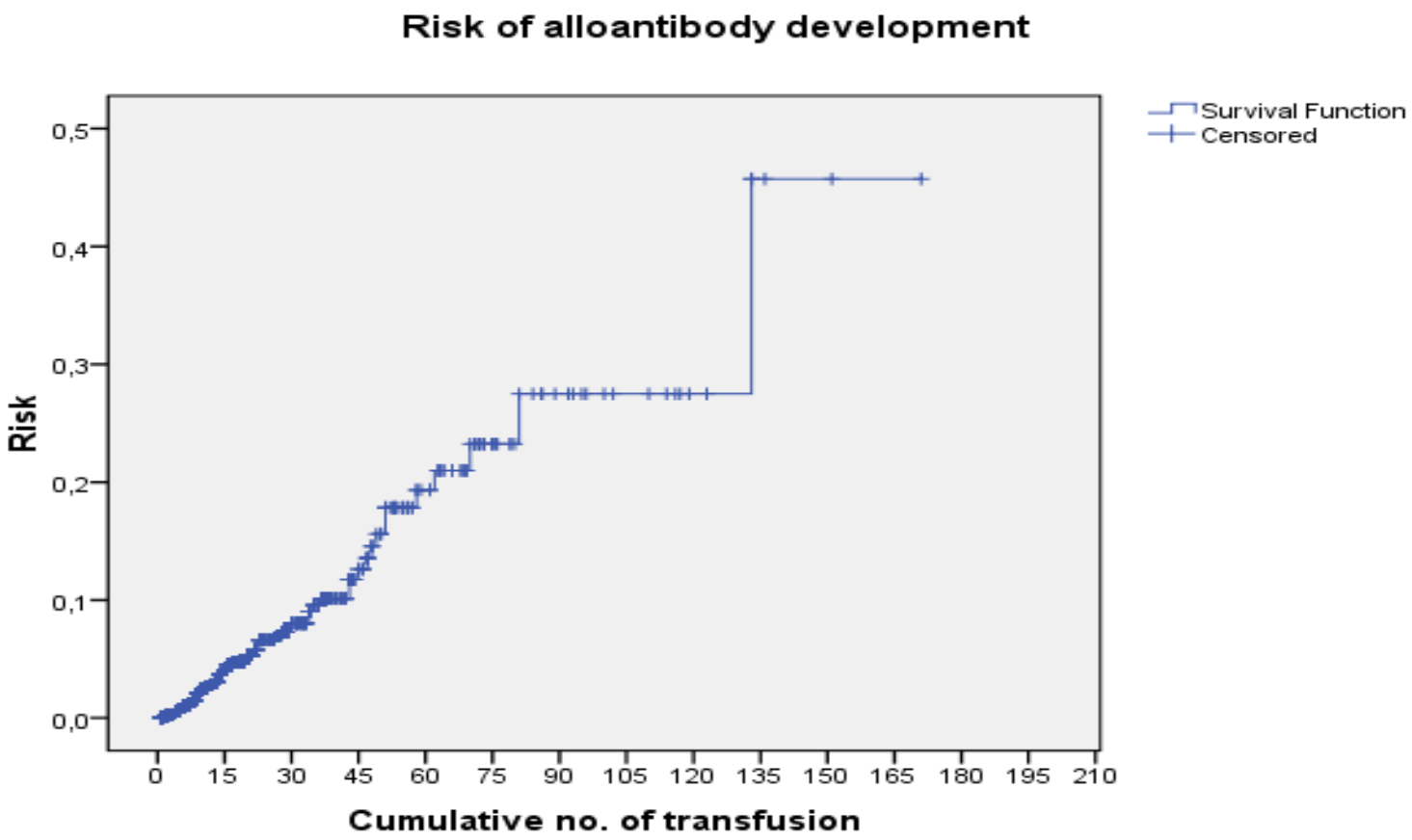
3. Blood Sampling:

Detailed blood serology, SNPs coding for HLA types,

Preliminary Incidence investigation results

- Incidence of alloantibody formation among general RBC transfused population
- LUMC 2005- 2008
- GLIMS at IHB-LUMC
- 6316 inclusions; 101 first time alloAbs
- 45,883 transfusion units

Hazard Plot


Risk of alloantibody development
Survival Function
Censored
Risk
0,5
0,4
0,3
0,2
0,1
0,0
0
15
30
45
60
75
90
105
120
135
150
165
180
195
210
Cumulative no. of transfusion

What is needed for this study..?

√ CME approval at study base LUMC, Leiden

Local CME approval in other centres

patient list extraction GLIMS (2/ year)

case and control selection + medical, contact information

send questionnaire + consent form to participants

blood sampling appointments (4 time per year)

blood sampling + analysis

Annual results and reports

First request now…..

- To get in contact with for the transfusion service responsible person(s) within the hospitals
- To form a working group and share information
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