The incidence of erythrocyte alloimmunization in pregnant women

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AIM OF THE STUDY

To determine the incidence of clinically significant anti-erythrocyte alloantibodies in pregnant women, which can cause severe hemolytic disease in the fetus and newborn.

METHODS

Between the years 2000-2010, a total of 42123 pregnant women were examined at the Department of Transfusion Medicine at the University Hospital Olomouc. Screening for irregular anti-erythrocyte antibodies followed by identification of the alloantibody was performed in all women at the beginning of the pregnancy.

RESULTS

Clinically significant anti-erythrocyte antibodies were diagnosed in 1.5% pregnant women (626/42123). The most common cause of maternal alloimmunization was antigen E with an incidence of 5.4‰ (226/42123), followed by antigens D 4.1‰ (171/42123), M 1.5‰ (65/42123), C 1.2‰ (51/42123), K 1.2‰ (51/42123), c 0.6‰ (24/42123), S 0.5‰ (19/42123), Jk^a 0.2‰ (9/42123), PP_{1pk} (Tj^a) 0.1‰ (3/42123) and antigen Fy^a 0.0‰ (2/42123).

CONCLUSION

Despite performing prophylaxis for RhD alloimmunization by administering anti-D immunoglobulin to RhD negative women during pregnancy and after the birth of an RhD positive child, antigen D still represents the 2nd most frequent cause of maternal erytrocyte alloimmunization. The remaining clinically significant alloimmunizations are caused by non-D antigens of the Rh system, antigens of the Kell system, and rarely observed antigens of the MNS and Kidd blood systems.

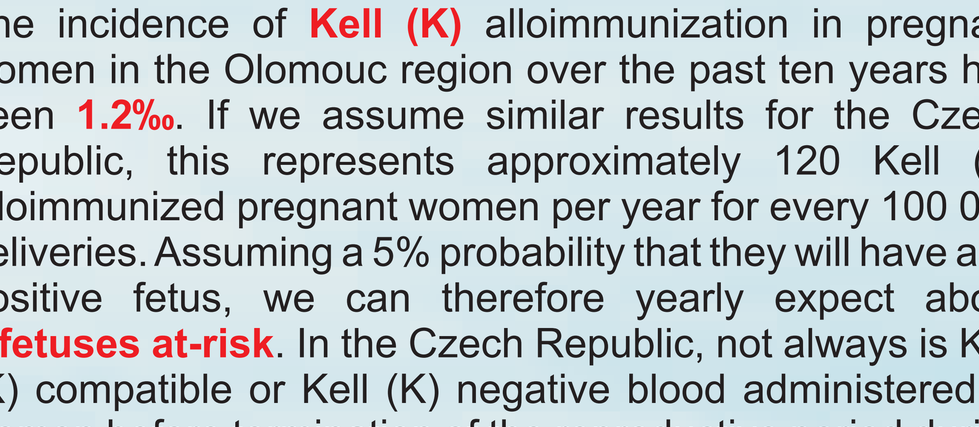
In the past six years, the incidence of **RhD** alloimmunization in pregnant women was **5‰** in the Olomouc region. If we assume similar results for the Czech Republic, this yearly represents approximately 500 RhD alloimmunized pregnant women for every 100 000 deliveries. If two-thirds of them have an RhD positive child, this yearly represents about **333 fetuses at-risk**. All cases of RhD alloimmunization can theoretically be prevented by prophylactic administration of an adequate dose of anti-D immunoglobulin after all potentially sensitising events.

The incidence of **Kell (K)** alloimmunization in pregnant women in the Olomouc region over the past ten years has been **1.2‰**. If we assume similar results for the Czech Republic, this represents approximately 120 Kell (K) alloimmunized pregnant women per year for every 100 000 deliveries. Assuming a 5% probability that they will have a K-positive fetus, we can therefore yearly expect about **6 fetuses at-risk**. In the Czech Republic, not always is Kell (K) compatible or Kell (K) negative blood administered to women before termination of the reproductive period during transfusion.

Erythrocyte alloimmunization in pregnant women
(No = 42123)

erythrocyte antigen		No	ratio %		incidence ‰	
Rh	**D**	171	27.3	76.2	4.1	11.3
	C	51	8.1		1.2	
	c	24	3.8		0.6	
	E	226	36.1		5.4	
	e	5	0.8		0.1	
Kell	**K**	51	8.1		1.2	
MNS	**M**	65	10.4	13.4	1.5	2.0
	S	19	3.0		0.5	
Kidd	**Jk^a**	9	1.4		0.2	
Duffy	**Fy^a**	2	0.3		0.0	
P	**PP_{1pk} (Tj^a)**	3	0.5		0.1	
		626	100.0		14.9	

RhD alloimmunization
incidence in pregnant women (‰)



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