

ADVERSE REACTIONS AFTER BLOOD DONATION RISK PROFILE WITH SPECIAL EMPHASIS ON ELDERLY BLOOD DONORS

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Background

Donating blood is extremely safe¹. Nevertheless, continuous monitoring and evaluation of donor reactions as part of the hemovigilance surveillance is important to ensure donor safety and to maintain donation commitment^{2,3}. Setting upper age limits for blood donation has been discussed controversially as age-related increase in vascular degeneration and cardiovascular diseases in the elderly could presumably exacerbate the risk of blood donation related adverse events (DAE)⁴. Given the current demographic changes, age restricted donor acceptance criteria will have an increasingly negative impact on potential donor resources and lead to progressively tightening of blood supply.

Study Design and Methods

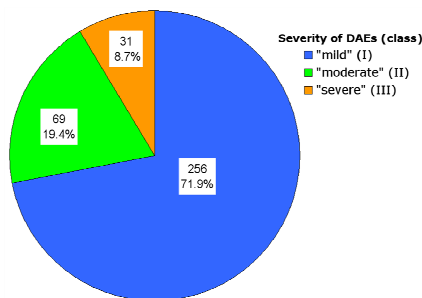
The records of 60'726 whole-blood donations from a 12-month period were assessed retrospectively for occurrence and severity (class I-III) of DAEs. All blood donors (BD) fulfilled the acceptance criteria for voluntary blood donation as issued by the Swiss Red Cross. Additionally, BD over the age of 65 were accepted for donation based on a specially designed questionnaire (GEFA) focusing on symptoms of age related diseases such as vascular, cardiac and pulmonary insufficiencies as well as neoplastic and proliferative conditions. In cases of suspected GEFA findings the donor candidate was examined by a physician who decided on acceptance for donation or further physical evaluation.

This study applied multiple logistic regression analysis to assess independent risk factors for DAEs. Additionally the impact of DAEs on the likelihood of donation adherence within the following 24 months was evaluated.

Results

A total of 356 cases of DAEs were identified among the 60'726 whole-blood donations. The overall prevalence of DAE was therefore 0.6%. Figure 1 shows the absolute and the relative frequencies of class I-III DAEs.

Figure 1:



Significant predictors were female gender, first-time donor status and BMI (body mass index) < 20 as compared to donors with BMI > 25. Surprisingly, the strongest reverse predictor was age. Compared to the reference age group (ages 51-65) the adjusted ORs demonstrate that the oldest BDs (ages 66-75) had the lowest risk for DAEs as compared to BD of younger age (table 1).

Conclusions

- DAE are very rare, nevertheless they have a negative impact on donor's adherence to blood donation.
- DAE occur most likely in young, female and first time donors especially in combination with low BMI.
- DAE occur more frequent in fixed donation environment as compared to mobile blood drives.
- Carefully selected elderly BDs are less likely hit by DAE as compared to young BDs. Confirmation of these findings might be important for future definition of revised acceptance criteria for voluntary blood donation.

Vasovagal reactions significantly reduced the likelihood of future blood donation, as shown in table 2. Blood donors older than 50 years showed the highest probability of return donation (table 2).

Table 1: Odds ratio for DAEs with regard to sex, age-group, donor status, BMI and donation site

	Adjusted OR (95% CI(OR))*	p - value
Sex		
Male	1	
Female	2.68 (2.13 - 3.37)	< 0.001
Age-group		
18 - 30 years	5.50 (3.77 - 8.02)	< 0.001
31 - 50 years	1.57 (1.04 - 2.34)	0.028
51 - 65 years	1	
66 - 75 years	0.17 (0.02 - 1.22)	0.077
Donor status		
First time donor	3.10 (2.46 - 3.90)	< 0.001
Repeat donor	1	
Donation site		
Hirschengraben	1.96 (1.54 - 2.49)	< 0.001
Limmattal	3.44 (2.30 - 5.11)	< 0.001
Uster	1.05 (0.56 - 1.95)	0.87
Winterthur	0.42 (0.20 - 0.86)	0.017
Mobile blood drives	1	
BMI-group**		
< 20	2.05 (1.38 - 3.04)	< 0.001
20 - 25	1.68 (1.23 - 2.30)	0.001
> 25	1	

Number of donations included in the multiple logistic regression n= 59.276 (including the 356 DAEs)

* OR= 1 reflects reference group

** BMI (Body Mass Index): 1450 (2.4%) missing

Table 2: Odds ratio for donor return with regard to DAE, sex, age-group, donor status and donation site

	Adjusted OR (95% CI(OR))*	p - value
Complication (DAE)		
No DAE	2.92 (2.30 - 3.70)	< 0.001
DAE	1	
Sex		
Male	1	
Female	0.98 (0.92 - 1.02)	0.292
Age-group		
18 - 30 years	0.24 (0.22 - 0.26)	< 0.001
31 - 50 years	0.59 (0.55 - 0.63)	< 0.001
51 - 65 years	1	
66 - 75 years	0.90 (0.78 - 1.05)	0.198
Donor status		
First time donor	0.25 (0.23 - 0.26)	< 0.001
Repeat donor	1	
Donation site		
Hirschengraben	1.83 (1.72 - 1.95)	< 0.001
Limmattal	2.26 (1.98 - 2.58)	< 0.001
Uster	2.12 (1.85 - 2.43)	< 0.001
Winterthur	1.97 (1.70 - 2.17)	< 0.001
Mobile blood drives	1	

Number of donations included in the multiple logistic regression n= 60.726

* OR = 1 reflects reference group

References

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