

Risk factors for tiredness after blood donation: results from the Evasion study

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**18th INTERNATIONAL
HAEMOVIGILANCE
SEMINAR**
10 & 11 JULY, 2018 - MANCHESTER, UK

Blood donor adverse events (grade >=2)

France, 2014

2,5 million whole blood donation

0,7 million apheresis

Adverse events	n=			%	Incidence per 100 000 donation		
	Whole Blood	Apheresis	Total		Whole Blood	Apheresis	Total
Immediate fainting reactions	3442	476	3918	75,38%	135,9	161,6	138,6
Hematoma	277	203	480	9,23%	10,9	68,9	17,0
Delayed fainting reactions	346	34	380	7,31%	13,7	11,5	13,4
Arterial ponction	165	7	172	3,31%	6,5	2,4	6,1
Citrate toxicity	0	73	73	1,40%	0	24,8	2,6
Neurological injury at site of venipuncture	39	5	44	0,85%	1,5	1,7	1,6

Prevention of fainting reactions and/or tiredness after whole blood donation: a randomized trial assessing hydration and/or muscle tension exercices (Evasion study, Morand et al, Transfusion, 2016)

- Factorial design, cluster randomization (1 cluster = 1 blood donation unit)
- Comparison of 6 strategies regarding **hydration**:
 - ✓ 500mL of an **isotonic drink** (two tablets of Isostar power Tabs, lemon flavor) in slightly mineralized water
 - ✓ 500mL of **slightly mineralized water**
 - ✓ **advice to drink a glass of** slightly mineralized water or fruit juice)
- with or without :
 - ✓ **muscle tensing exercises**
- Donor phone interview one week after donation



Fainting reactions occurrence

Fainting reactions in the Evasion study:

- At the donation unit: the need to lie down in the “Trendelenburg” position.
- After leaving the donation unit: the need to sit or lie down, up to 48 hours after donation.

Fainting reactions	All donors (n=4576)	Female donors (n=2302)	Male donors (n=2274)	OR
Overall	5,5% (n=253)	8,1% (n=187)	2,9% (n=66)	3,0 p<0,01
On-site	3,0% (n=136)	3,7% (n=86)	2,2% (n=50)	1,7 p<0,01
Off-site	3,0% (n=137)	5,1% (n=117)	0,9% (n=20)	6,0 p<0,01
Both on-site and off-site	0,4% (n=20)	0,7% (n=16)	0,2% (n=4)	4,0 p=0,014

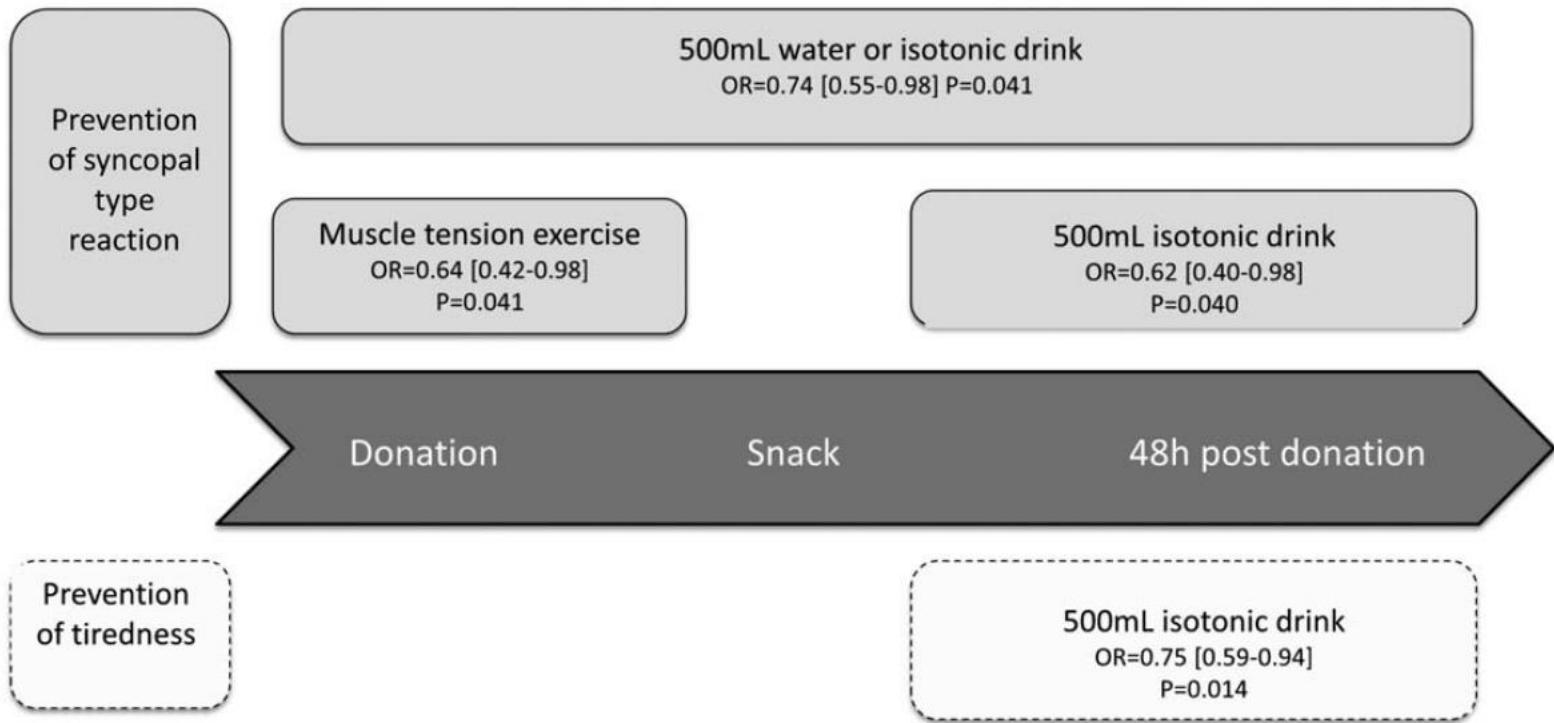
Tiredness occurrence

Post-donation tiredness in the Evasion study:

- Unusual tiredness occurring within 48 hours after blood donation

	All donors (n=4572)	Female donors (n=2302)	Male donors (n=2274)	OR
Post- donation tiredness	17,9% (n=820)	11,9% (n=542)	6,1% (n=278)	p<0,01

Evasion study results



Summary of the interventions and the phases of blood donation where they appear to have a beneficial effect.

Morand C et al, Transfusion, 2016

Risk factors for fainting reactions in male and female blood donors

Evasion study findings

- **Female donors** were at a higher risk of fainting reactions, especially for off-site fainting reactions.
- **Young age / student status**, as well as **reduced physical status**, were associated with an increased risk of fainting reactions in female donors and not in male donors.
- **1rst time donation** was associated an increased risk of fainting reactions in male donors and not in female donors.
- **Increasing hemoglobin levels** was associated with an increased risk of fainting reactions both in male and female donors.
- **Stress related to donation** was associated with an increased risk of fainting reactions in male and female donors, but maybe more so in male donors.
- **Pain at venipuncture and during donation** was associated with an increased risk of fainting reactions in male and not in female donors.

Risk factors for on-site and off-site fainting reactions in female blood donors

Evasion study findings

- **Young age/ student status** as well as **reduced physical status** were associated with increased risks of both on-site and off-site fainting reactions.
- **Stress related to donation** and **pain during donation** were associated with an increased risk of on-site fainting reactions, while **increasing hemoglobin levels** and **decreasing systolic arterial pressure** were associated with an increased risk of off-site fainting reactions.
- The occurrence of an **on-site fainting reaction** was associated with an increased risk of off-site fainting reactions.

Study aim:

To confirm / identify and quantify risk factors for tiredness after blood donation in male and female donors and evaluate the influence of such tiredness on donation return rat

Study methods:

- Data pertaining to putative post-blood donation tiredness were prospectively collected.
- Odd ratios were determined by univariate analysis, followed by a multivariate analysis by means of a backward stepwise elimination in a conditional logistic regression model.

Variables examined

Type of blood drive:

- Fixed vs mobile
- Workplace vs school vs public venue
- Truck vs hall/room

- Age
- Student status
- Weight
- Height
- Body mass index
- Hemoglobin
- Arterial pressure
- Blood collection volume (420, 450, 480 ml, adapted to gender, weight and height)
- Stress
 - Family
 - Professional
 - Blood donation
- 1^{er} donation
- Physical status
- Appointment (vs walk-in)

- Appointment (vs walk-in)
- Donation time
 - Before work
 - After work
 - During a work day
 - Off-work day
 - No professional activity
- Physical activity before donation
- Collation before donation
- Pain at time of venipuncture, during donation, at time of needle withdrawal
- Drink before donation (other than study drinks)
- % blood volume harvested
- Donation duration
- Distance between blood donation and collation
- On-site fainting reaction

All variables with a p value < 0,2 in an univariate analysis were introduced in the multivariate analysis

Tiredness risk factors in blood donors (1/2)

Multivariate analysis

(n=4572)	Odd Ratio (OR)	95% IC	p-value
Female (vs male)	2,07	1,75-2,45	<0,001
Student (a variable closely linked to age)	1,27	1,08-1,55	0,21
First donation	2,08	1,66-2,60	<0,001
Appointment (vs walk-in)	1,45	1,21-1,47	<0,001

Tiredness risk factors in blood donors (2/2)

Multivariate analysis

(n=4572)	Odd Ratio (OR)	95% IC	p-value
Reduced physical status (continuous variable)	1,08 per reduced grade on a 0 to 10 scale	1,01-1,16	0,029
Family-related stress	1,37	1,02-1,83	0,034
Pain at veinipuncture (continuous variable)	1,07 per grade increase on a scale from 0 to 10	1,02-1,11	0,001
On-site fainting reaction	2,63	1,81-3,81	<0,001

Influence of tiredness occurrence upon donor return (within one year)

Tiredness occurrence	Donor return frequency (%)	OR	95% IC	p-value
All donors (n=4572)	51,3 vs 69,0	0,47	0,41-0,55	<0,001
Female donors	50,9 vs 64,0	0,58	0,48-0,71	<0,001
Male donors	52,2 vs 73,4	0,40	0,31-0,51	0,001

Influence of tiredness on donor return:

- more important in male donors than in female donors: p=0,026 for the interaction between donor gender and tiredness

Tiredness and off-site fainting after blood donation

- Among donors reporting tiredness, 11,4% reported off-site fainting
 - Among donors not reporting tiredness, 1,2% reported off-site fainting
- p < 0,01

Interaction between off-site fainting and tiredness on donor return

- Among donors reporting no off-site fainting
and no tiredness: 69% donor return
and tiredness: 52% donor return
 $p < 0,01$
- Among donors reporting off-site fainting:
and no tiredness: 48% donor return
and tiredness: 46% donor return
 $p = 0,87$

Tiredness reduced donor return in the absence of off-site fainting reaction

Overall

- Risk factors for unusual tiredness after blood donation identified in the Evasion study comprise several previously identified fainting reaction risk factors (female, student status/young age, first donation, reduced physical status, pain at time of veinipuncture), with may vary quantitatively, and with some exceptions such as increasing hemoglobin level or the type of stress (work-related for fainting reactions vs family-related for tiredness)
- Early (on-site) fainting reaction occurrence was associated with post-donation tiredness.
- The observed association between post-donation tiredness and a blood donation on the basis of an appointment (cs walk-in) requires further evaluation.
- Post-donation tiredness had an impact on donor return.
- Lastly, if female donors reported more tiredness, the impact of tiredness on their return rate was less important than in male donors.
- Such findings should pave the way to the implementation of more individualized risk prevention strategies.

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And our blood donors!

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