

## View Abstract

**CONTROL ID:** 2532989**TITLE:** Effect of age, sex or frequent blood donations on donor's ferritin levels and red blood cell storage stability**AUTHORS (FIRST NAME, LAST NAME):** Tamir Kanias<sup>1</sup>, Marion C. Lanteri<sup>2</sup>, Sheila Keating<sup>2</sup>, Grier P. Page<sup>3</sup>, Don Brambilla<sup>4</sup>, Stacy M. Endres<sup>4</sup>, Alan E. Mast<sup>5</sup>, Ritchard G. Cable<sup>6</sup>, Darrell J. Triulzi<sup>7,8</sup>, Joseph E. Kiss<sup>8</sup>, Mark T. Gladwin<sup>1</sup>, Steve Kleinman<sup>9</sup>, Michael Busch<sup>2</sup>**INSTITUTIONS (ALL):** 1. Medicine, University of Pittsburgh , Pittsburgh, PA, United States.

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**PRESENTATION TYPE:** Oral or Poster Presentation**CURRENT CATEGORY:** Scientific**ABSTRACT BODY:**

**Background/Case Studies:** Red blood cell (RBC) donors represent a diverse population where the effect of biological variables such as age, sex or iron status on RBC storage stability is largely unknown. The purpose of this study was to further characterize the effect of such variables using various measures of hemolysis as end-point measurements of storage quality.

**Study Design/Methods:** Leukocyte-reduced RBC units were donated by 13,771 enrolled donors who participated in the Red Blood Cell-Omics (RBC-Omics) study, which is part of NHLBI Recipient Epidemiology and Donor Evaluation Study-III (REDS-III). Ferritin levels (ng/mL) were determined in donors' plasma. RBCs (15 mL) were stored in transfer bags at 1-6° C for 39-42 days, after which RBCs were subjected to selected assays including percent storage hemolysis, osmotic hemolysis (Pink Test), and oxidative hemolysis using AAPH.

**Results/Findings:** Increased levels of storage hemolysis were positively correlated with age in both sexes, whereas age had a minor effect on predisposition to osmotic hemolysis. Conversely, aging was correlated with increased resistance to oxidative hemolysis in both sexes (Table 1). Ferritin levels were influenced by sex and age, although no strong correlation was observed between ferritin and the three hemolytic assays. Analysis of prior donation intensity (number of donations in the past 24 months) suggested that donation of 10 or more units is associated with increased resistance to oxidative hemolysis and decreased levels of ferritin.

**Conclusion:** Our findings emphasize the effect of donor's age and sex on RBC storage stability and predisposition to stress-induced hemolysis. Furthermore, the effect of prior donation on ferritin levels and predisposition to oxidative hemolysis may be explained by iron loss, and may require further investigation to determine possible consequences on donor's health and RBC storage stability.

Table 1: Effect of donor's sex and age on RBC hemolysis or ferritin levels. Males: Top values; Females; Bottom values. Mean ±SD

Age (years)	18-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	>65
Storage (%)	0.36±0.27	0.38±0.27	0.39±0.29	0.41±0.31	0.41±0.28	0.41±0.26	0.40±0.33	0.40±0.26	0.41±0.29	0.38±0.26	0.41±0.29
	0.33±0.21	0.34±0.58	0.32±0.16	0.32±0.15	0.36±0.42	0.34±0.16	0.35±0.24	0.35±0.22	0.36±0.23	0.35±0.17	0.36±0.2
Osmotic (%)	27.8±13.3	29.1±13.8	30.4±13.4	31.2±14.1	31.3±13.6	32.1±14.0	32.0±13.3	31.1±13.6	30.5±13.3	30.0±12.3	29.9±12.3
	26.7±12.6	25.5±12.0	24.6±12.1	25.3±12.1	25.3±12.4	24.9±12.3	26.1±12.8	26.0±12.2	26.8±12.2	26.7±12.4	25.5±11.0
Oxidative (%)	39.7±10.3	40.6±10.0	39.4±9.1	39.8±9.6	39.4±10.2	39.6±10.0	39.1±10.2	37.6±10.0	36.2±9.6	35.7±9.7	33.4±9.9
	38.4± 8.7	38.5± 9.4	37.5±9.8	37.8±10.4	38.1± 9.9	38.1±10.1	36.3±10.1	35.5±10.1	34.5±9.3	32.5±8.7	32.4±9.5
Ferritin (ng/mL)	69.2±55.7	82.0±70.7	93.2±85.0	95.8±101	91.3±98.8	102±132	74.6±92.5	63.8±72.4	60.3±83.3	53.5±72.2	41.4±47.1
	23.3±26.2	29.4±30.6	34.3±37.9	35.6±39.1	38.2±38.1	33.8±45.6	34.1±40.6	38.5±41.5	37.5±37.8	36.7±42.3	35.3±44.0

**AWARDS:**

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