Investigation of iron stock status in female blood donors using evaluation of iron and ferritin

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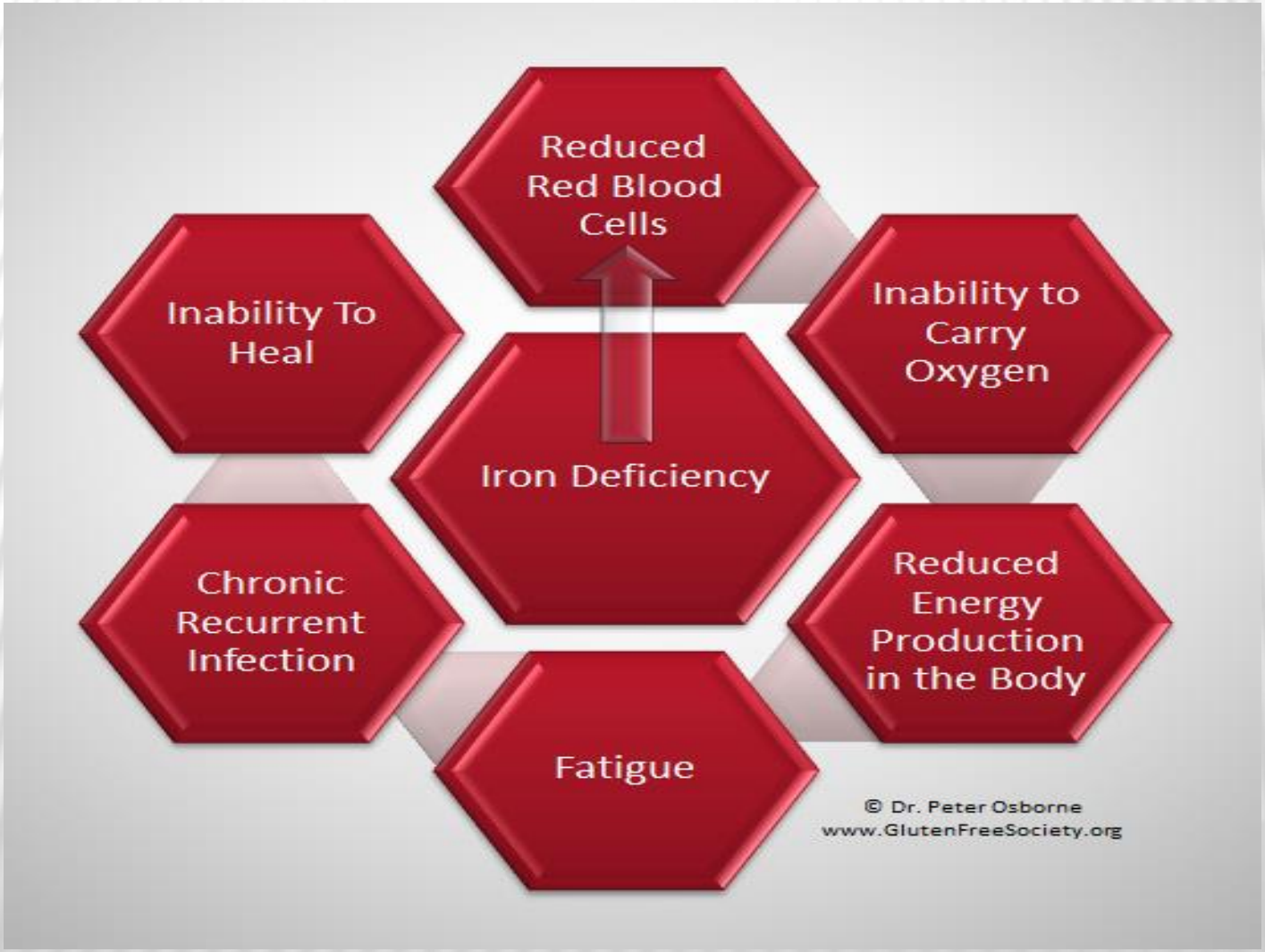
INTRODUCTION



INTRODUCTION

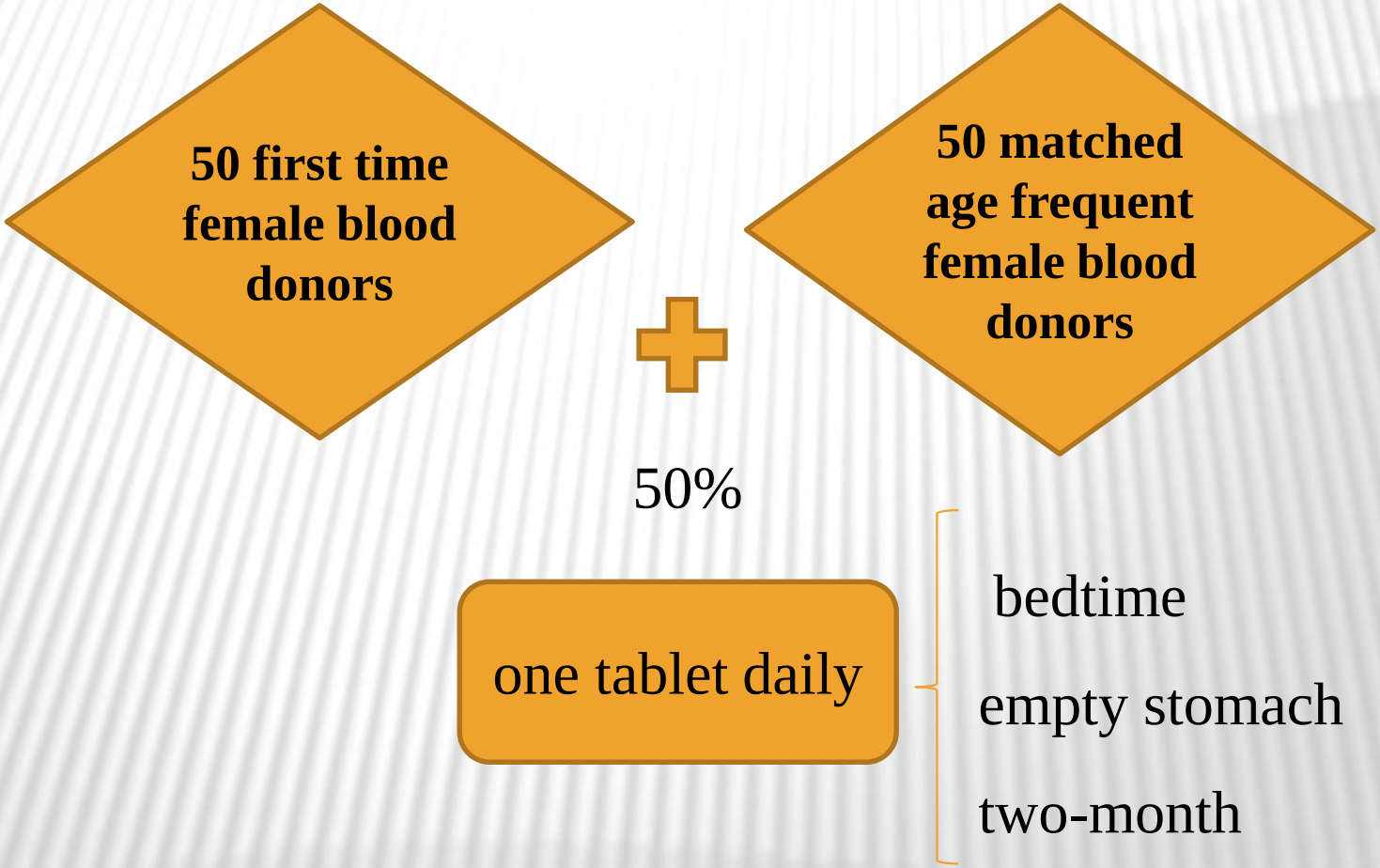
- Iron deficiency is so common in female donors and frequent donors (250 mg)
- A minimum acceptable hemoglobin concentration is 12.5 g/dL and a minimum interval between donations is four months
- Iron store deficiency can also be one of the reasons for the decrease in the number of blood donation

Iron status	Serum ferritin levels
Absent iron stores	< 12 µg/l
Low iron stores	12–24 µg/l
Adequate iron stores	> 25 µg/l

AIM OF STUDY

- The prevalence of anemia in women community
- Evaluate iron status of blood donors with more laboratory examinations
- Investigate the effect of daily iron supplements after blood donation on time to recovery of hemoglobin and iron stores

METHODS



- Blood samples: donation day/ two/four/six month

PROTOCOL

- serum iron level ⟹ Pars-Azmoon kit. (N .V : 25-134 µg/ dL)

- Ferritin ⟹ ELISA / Monobind kit. (N.V 12-123 ng / ml)

RESULTS

Comparison of iron value in female blood donors

Mean of iron in first time donors group							
Without taking tablet				Tablet consumers group			
Day of donate	Two months later	Four months later	Six months later	Day of donate	Two months later	Four months later	Six months later
28.1±4.9	21.2±3.3	23.2±3.3	25.8±4.1	28.4±4.7	27.9±3.6	28.5±3.5	32.1±4.4

Mean of iron in repeated donors group							
Without taking tablet				Tablet consumers group			
Day of donate	Two months later	Four months later	Six months later	Day of donate	Two months later	Four months later	Six months later
24.2±5.6	17.7±2.7	20.2±3.9	26.7±3.9	23.9±4.0	23.0±2.7	24.1±2.7	28.8±3.1

RESULTS

Comparison ferritin of value in female blood donors

Mean of ferritin in repeated donors group							
Without taking tablet				Tablet consumers group			
Day of donate	Two months later	Four months later	Six months later	Day of donate	Two months later	Four months later	Six months later
13.3±6.5	**8.3±2.9**	**10.4±2.0**	**14.8±2.3**	**12.9±5.9**	**14.3±2.0**	**16.7±1.8**	**20.6±2.1**

Mean of ferritin in first time donors group							
Without taking tablet				Tablet consumers group			
Day of donate	Two months later	Four months later	Six months later	Day of donate	Two months later	Four months later	Six months later
16.3±5.6	**10.0±3.4**	**12.1±3.6**	**16.5±4.1**	**16.0±5.0**	**17.8±3.4**	**18.9±4.2**	**24.0±1.4**

RESULTS

- Prevalence of insufficient serum ferritin ⟹ 48%.
- Frequency of anemia
  - frequent donors ⟹ 69.8%
  - first time donors ⟹ 47.7%
- About two-thirds of female repeat donors had low or absent iron stores.
- ferritin Values <15 ng/ml were found in 85 percent of female donors who donated three times per year.

RESULTS

- 66% of first-time donors exempted on next visit due to **anemia**
- 75% of people who donated at intervals of less than six months have been excluded from the third visit because of anemia. They were able to re-donate blood after **using a period of iron supplement over a six-month**.
- 68%Female repeated donors were often iron deficient despite passing a hemoglobin screen.

DISCUSSION

- Punnonen(1998) ⟶ low iron stores 17%
- Tradtony (1999) ⟶ IDA 36.5%
- Cancado (2001) ⟶ low iron stores 41.5%
- Javadzadeh (1382)
  - low iron stores 100%
  - IDA 55.6%
  - Reduce iron 78%

DISCUSSION

- Kasraeian(1384)
  - Reduce ferretin ⇒ increase donation
  - low iron stores 34% ⇒ first time
  - low iron stores 47.9% ⇒ 1/y
  - low iron stores 77% ⇒ 3/y

DISCUSSION

- Women who had donated 3 units in the preceding one year had an increase in the risk of iron deficiency compared to first-time donors.
- With replete iron stores, erythropoiesis can readily be increased to replace red blood cells removed at donation.
- These findings highlight the point that the current standard of 4 months is insufficient to replenish iron stores
- Without iron supplements, 67% of participants did not recover iron stores by 4 months.