To the editor:

Is the recommended daily iron intake for women too low?

The recommended daily allowance/intake (RDA/RDI) for iron in menstruating and nonmenstruating women in the United Kingdom is 14.8 mg and 8.7 mg, respectively,1 whereas in the United States, 18 mg and 8 mg are the general recommendations.2 The RDA/RDI levels are therefore considered sufficient to maintain the female iron balance; however, with 90% of menstruating and 34% of nonmenstruating United Kingdom women failing to attain these levels from their diet,3 supplementation is required.

Serum ferritin concentrations, in the absence of inflammation, provide a reliable estimate of a person’s iron status.3 Although a value of 69 \( \mu g/L \) indicates a 99% level of confidence for stainable bone marrow iron,4 Guyatt et al suggest that a serum ferritin concentration of 100 \( \mu g/L \) or higher ensures that a person is iron replete without the need to undertake bone marrow aspirates.5 In a study of more than 500 menstruating United Kingdom wartime servicewomen receiving a daily food ration providing 35 mg of iron, all had significant increases in hemoglobin concentrations 10 months later.6 In men and women given a daily iron supplement of 100 mg, increases in hemoglobin concentrations occurred only in females and the mean values between the sexes were very similar.7 Serum ferritin estimations were not available to these earlier researchers nor did they know about hepcidin and iron regulation.8

We observed 52 iron-replete (serum ferritin \( \geq 100 \mu g/L \), erythrocyte sedimentation rate [ESR] \( \leq 10 \text{mm/h} \)) women who for 6 months received either a daily iron (Fe) supplement providing Fe 24 mg or Fe 48 mg, or nothing. There were no vegetarians in group I, 1 in groups II and IV, and 2 in groups III and V. No person was vegan.

Nonmenstruating and menstruating women who received no iron (groups I and III) had significant decreases in the mean serum ferritin level after 6 months, as did menstruating women receiving Fe 24 mg/d (group IV; Table 1). In contrast, in nonmenstruating women who received Fe 24 mg/d (group II) and menstruating women receiving Fe 48 mg/d (group V), no significant change was observed.

If the RDA/RDI values are adequate, based on dietary data1 we would have expected 66% of nonmenstruating women in the United Kingdom to be capable of maintaining their baseline serum ferritin level; however, only 1 woman (11%) in group I (no iron) was able to do so. In contrast, 10 nonmenstruating women (90%) taking Fe 24 mg/d (group II) maintained their ferritin concentrations. It is noteworthy that this level of iron supplementation is 3 times higher than the United States/United Kingdom RDA/RDI recommendations. In menstruating women taking no iron (group III), we expected 10% capable of maintaining their serum ferritin concentration by diet alone; none were able to do so. In menstruating women taking Fe 24 mg/d, only 3 (25%) maintained their ferritin status. In those taking Fe 48 mg/d (group V), 80% maintained their serum ferritin concentrations; however, 20% remained in a negative iron balance despite taking 3 times the RDA/RDI levels.

The RDA/RDI recommendation for iron in women appears inadequate, and further study in a larger cohort of iron-replete women is urgently required.

D. Hugh Rushton
School of Pharmacy & Biomedical Sciences, University of Portsmouth, Portsmouth, United Kingdom

Robin Dover
School of Pharmacy & Biomedical Sciences, University of Portsmouth, Portsmouth, United Kingdom

Michael J. Norris
School of Pharmacy & Biomedical Sciences, University of Portsmouth, Portsmouth, United Kingdom

Jeremy J. H. Gilkes
The Lister Hospital, London, United Kingdom

Conflict-of-interest disclosure: The authors declare no competing financial interests.

Correspondence: Dr D. Hugh Rushton, 24 Harmont House, 20 Harley St, London W1G 9PJ, United Kingdom; e-mail: rushton@btinternet.com.

### Table 1. Fasting serum ferritin concentrations from 52 iron-replete* women basally and after 6 months of taking a daily iron supplement providing either 24 mg or 48 mg of iron or no supplementation

<table>
<thead>
<tr>
<th>Group</th>
<th>Age, y</th>
<th>Baseline ferritin, ( \mu g/L )</th>
<th>Ferritin at 6 mo, ( \mu g/L )</th>
<th>Weekly change, ( \mu g/L )</th>
<th>( P )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nonmenstruating women, n = 20</td>
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<tr>
<td>No Fe/group I, n = 9</td>
<td>62 ± 8.4</td>
<td>193 ± 78</td>
<td>142 ± 67</td>
<td>−1.98 ± 1.00</td>
<td>&lt; .004</td>
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<tr>
<td>Fe 24 mg/group II, n = 11</td>
<td>58 ± 9.0</td>
<td>151 ± 67</td>
<td>146 ± 34</td>
<td>−0.18 ± 0.90</td>
<td>.765</td>
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<tr>
<td>Menstruating women, n = 32</td>
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<tr>
<td>No Fe/group III, n = 10</td>
<td>40 ± 11.8</td>
<td>205 ± 48</td>
<td>147 ± 54</td>
<td>−2.26 ± 1.06</td>
<td>&lt; .002</td>
</tr>
<tr>
<td>Fe 24 mg/group IV, n = 12</td>
<td>41 ± 9.1</td>
<td>137 ± 35</td>
<td>112 ± 40</td>
<td>−0.96 ± 0.86</td>
<td>&lt; .001</td>
</tr>
<tr>
<td>Fe 48 mg/group V, n = 10</td>
<td>42 ± 8.2</td>
<td>156 ± 64</td>
<td>151 ± 45</td>
<td>−0.19 ± 1.16</td>
<td>.846</td>
</tr>
</tbody>
</table>

*Serum ferritin \( \geq 100 \mu g/L \) and ESR \( \leq 10 \text{mm/h} \).

Within-group statistical analysis (Wilcoxon signed rank test). Values are expressed as mean ± standard deviation.
References


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