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Letter to the Editor: The prevalence and impact of heavy menstrual bleeding amongst athletes and mass start runners of the 2015 London Marathon

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The single most common cause of iron deficient anaemia in the developed world in premenopausal females is the menstrual cycle.[1] It is well recognised and reported that amenorrhoea and oligomenorrhoea are common in elite athletes typically as a result of relative energy deficiency,[2] however, little is known about the prevalence of other menstrual abnormalities. Heavy menstrual bleeding (HMB or *menorrhagia*) affects a quarter of the general population,[3] yet no data exist for athletes or exercising women. It is possible that HMB might impact significantly upon women's participation in sport. HMB can lead to fatigue, anxiety, reduced mood and energy levels with a negative impact on quality of life and productivity.[4] Furthermore, iron turnover in exercising females is likely to be increased further due to factors such as haemolysis putting them at a high risk of iron deficiency anaemia.[5] Iron is an essential micronutrient required for numerous biological functions, and deficiency can result in adaptive changes limiting haemoglobin production and a state of iron deficiency anaemia. We sought to identify the prevalence and impact of HMB in exercising females where anaemia may have a significant effect on training and performance.

We recently conducted a 'Female Health Questionnaire', which incorporated a validated diagnostic HMB series, demographics, athlete ability data, training status, known anaemia, iron supplementation and questions concerning the effect of the menstrual cycle on training and performance. The survey was initially conducted online (n=789 women), advertised via social media. Subsequently, to obtain non-biased data, the same survey was then conducted via face-to-face interviews with runners during registration for the 2015 London Marathon Exhibition (n=1073 women). Among the group a total of 90 participants were classified as 'elite'. The key findings from this survey were that HMB was common in both groups; reported by over half of those online (54%), and by more than a third of the marathon runners (36%). 55% (online) and 32% (marathon runners) stated that their menstrual cycle impacted upon training and performance, this being more common in those with HMB ($\chi^2=183.4$, $p<0.01$). Surprisingly, HMB was also prevalent amongst elite athletes (37%). Overall, 32% of all participants reported a history of anaemia, with this also being more common in those who have experienced HMB (41% vs. 26%; $\chi^2=70.765$, $p<0.01$), while 50% had previously supplemented with iron. Only a minority (22%) had sought medical

advice. No significant association was found between average weekly exercise volume and HMB presence.

In summary, we found HMB to be highly prevalent in female athletes, associated with anaemia, an increased use of iron supplementation and reported negative impacts on performance. Somewhat unexpectedly, our results suggest that HMB is more common in the exercising population than in the general population. Although there are a number of limitations to this questionnaire based study, we highlight that HMB may be under-recognised. Further research is needed to describe this issue and to understand its implications. Interventions to support female athletes such as iron therapy,[6] and an increased awareness of HMB amongst Sports Medicine professionals could have far reaching benefits for the female athlete.

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