Background Precise estimates of prevalence vary, but menstrual symptoms such as menorrhagia (heavy or prolonged bleeding) and dysmenorrhea (pain associated with period) are experienced by a large proportion of adolescent girls. Risk factors, co-morbidities and potential impacts of these menstrual problems on other areas of health and wellbeing are not well-characterised. We aimed to describe the prevalence of menorrhagia and dysmenorrhea in the Avon Longitudinal Study of Parents and Children (ALSPAC) cohort and to identify associations between these symptoms and other traits.

Methods Cases of both dysmenorrhea and menorrhagia were identified using self-report questionnaires administered nine times between the ages of 8 and 17 years (n = 4,222 responded to at least one). Cases were defined as respondents who had reported to have visited the doctor for the symptom, any time during puberty. We used the ALSPAC cohort’s corresponding epigenetic data resource, ARIES, to identify differences in methylation between cases for each symptom and those who never had reported it (controls), to identify traits associated with each symptom. These identified traits were then explored in the full ALSPAC cohort, using logistic regression.

Results Of the 4,222 adolescents who had responded to at least one of the puberty questionnaires, almost 70% (n = 2,915) had experienced dysmenorrhea at least once during puberty and over 50% (n = 2,123) had experienced menorrhagia. Of these, 22% (n = 641) and 25% (n = 527) visited the doctor for dysmenorrhea and menorrhagia, respectively. These symptoms showed significant overlap with one another, but remained distinctive. The epigenetic findings revealed potential associations with novel traits, including inflammatory markers and child abuse. In ALSPAC, both symptoms were shown to be associated with increased C-reactive protein and higher average adverse childhood experience (ACE) score, among other traits including prenatal smoke exposure, higher average body mass index and lower socioeconomic position.

Discussion The prevalence of both dysmenorrhea and menorrhagia is high in ALSPAC, highlighting an important and neglected area for population health research and intervention. These findings may suggest that exposure to ACE may go on to increase likelihood of enduring more severe menstrual symptoms in adolescence, potentially mediated by higher BMI and circulating inflammatory proteins. The implication of ACE adds to the growing body of evidence that they negatively affect long-term health. This study overall describes novel associations between menstrual symptoms and early life exposures that warrant further investigation.