



Lack of association between the *ESR1* rs9340799 polymorphism and age at menarche: a meta-analysis

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ABSTRACT. It has been reported that the estrogen receptor alpha (*ESR1*) rs9340799 polymorphism is associated with age at menarche (AAM). However, recent investigations have generated inconsistent results. This study aimed to establish a more precise estimation of the association between this polymorphism and AAM. A meta-analysis was conducted based on an *in silico* literature search using PubMed. Six studies presenting continuous data, including *ESR1* rs9340799 genotype frequencies, were selected. Effect size was estimated using Hedges' adjusted *g* with 95% confidence intervals (CIs), which were calculated based on the standardized mean difference between groups of subjects and different genotypes. No evidence of an association

between the *ESRI* rs9340799 polymorphism and AAM was found in the pooled continuous data under any genotype comparison (AA vs GG+AG: Hedges' $g = -0.085$, 95%CI = -0.202-0.032, $P = 0.156$; GG vs AA+AG: Hedges' $g = 0.143$, 95%CI = -0.041-0.327, $P = 0.129$; A vs G: Hedges' $g = 0.187$, 95%CI = -0.032-0.406, $P = 0.095$). Moreover, a funnel plot generated using this data was found to be symmetrical using the Egger ($P = 0.797$) and Begg tests ($P = 0.851$), indicating the absence of publication bias. In summary, our meta-analysis shows that the *ESRI* rs9340799 polymorphism is not a significant, independent contributing factor to AAM. To validate this finding, further studies involving larger numbers of participants are needed.

Key words: Meta-analysis; Age at menarche; *ESRI*