How contemporary human reproductive behaviors influence the role of fertility-related genes: an evolutionary approach.

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The concept of a "genotype rendered detrimental by progress" was advanced to account for the growing prevalence of such complex disorders as diabetes, obesity, hypertension, in industrialized populations. We propose a further example of this phenomenon for natural fertility genes, which find themselves to face the changing human reproductive patterns (e.g., family planning, delayed childbearing, and spacing birth order) in contemporary societies. We suggest here that, as fertility is a complex trait determined by gene-environment interactions, some common genetic variants may have become "detrimental" and therefore could be associated with reproductive system diseases causing infertility/subfertility following exposure to modern reproductive patterns. The same variants in natural fertility populations would have a minimal effect, if any, on fertility. In support of our hypothesis we give the examples of the fertility related genes ESR1, ACE, P53. Set within an evolutionary framework, we hypothesize that this phenomenon could lead to the selection of a set of gene variants fitter to current reproductive behaviours as the shift to later child-bearing age in developed countries.