
A biomedical perspective on parental effects

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Abstract

Session: Parental Effects I: Historical, Sociological, and Medical perspectives (Sarah Richardson- speaker; Miranda Waggoner - speaker; Peter Gluckman - speaker; Karola Stotz - organiser; Paul Griffiths -chair; Alan Beedle - chair) Studies from the 1930s had shown that fetal growth itself was subject to maternal non-genetic influences but it was not until the recognition of developmental teratogenesis and the development of experimental fetal physiology in the 1960s that it was accepted that the human fetus was not fully isolated from its maternal environment. Studies in the 1960s-1980s led to the recognition of long-term metabolic and physiological consequences of alterations in the fetal environment. While popularized by Barker in important studies, there were antecedent observations and arguments. While a limited adaptive argument focused on intrauterine growth retardation was suggested by Barker and Hales, a broad range of developmental environmental influences can have subsequent phenotypic effects. These may occur within the normative range of fetal development. Molecular epigenetic studies suggest that their contribution to disease risk by altering the sensitivity to altered environmental conditions can be considerable. Predictive adaptive mechanisms have been suggested to underlie the consequences of the variation within the normative range and where fetal nutrition is poor. The evolutionary novelty of maternal obesity may operate through different mechanisms. The consequences of gestational diabetes may reflect a mechanism that was adaptive in more nutritionally constrained pre-modern environments. An evolutionary perspective combined with molecular epigenetics is allowing greater dissection of the sequelae of maternal effects which, as a result of modern demographic (smaller family size etc) and environmental change, appear to be of greater importance than is generally recognized.

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