

## Endocrine disrupters and human health: could oestrogenic chemicals in body care cosmetics adversely affect breast cancer incidence in women?

### A review of evidence and call for further research

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### KEYWORDS

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### ABSTRACT

In the decade that has elapsed since the suggestion that exposure of the foetal/developing male to environmental oestrogens could be the cause of subsequent reproductive and developmental effects in men, there has been little definitive research to provide conclusions to the hypothesis. Issues of exposure and low potency of environmental oestrogens may have reduced concerns. However, the hypothesis that chemicals applied in body care cosmetics (including moisturizers, creams, sprays or lotions applied to axilla or chest or breast areas) may be affecting breast cancer incidence in women presents a different case scenario, not least in the consideration of the exposure issues. The specific cosmetic type is not relevant but the chemical ingredients in the formulations and the application to the skin is important. The most common group of body care cosmetic formulation excipients, namely *p*-hydroxybenzoic acid esters or parabens, have been shown recently to be oestrogenic *in vitro* and *in vivo* and now have been detected in human breast tumour tissue, indicating absorption (route and causal associations have yet to be confirmed). The hypothesis for a link between oestrogenic ingredients in underarm and body care cosmetics and breast cancer is forwarded and reviewed here in terms of: data on exposure to body care cosmetics and parabens, including dermal absorption; paraben oestrogenicity; the role of oestrogen in breast cancer; detection of parabens in breast tumours; recent epidemiology studies of underarm cosmetics use and breast cancer; the toxicology database; the current regulatory status of parabens and regulatory toxicology data uncertainties. Notwithstanding the major public health issue of the causes of the rising incidence of breast cancer in women, this call for further research may provide the first evidence that environmental factors may be adversely affecting human health by endocrine disruption, because exposure to oestrogenic chemicals through

application of body care products (unlike diffuse environmental chemical exposures) should be amenable to evaluation, quantification and control. The exposure issues are clear and the exposed population is large, and these factors should provide the necessary impetus to investigate this potential issue of public health.

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