

Lavender and tea-tree oil-induced gynecomastia in prepubertal boys warrants prudent use of herbal products

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Gynecomastia, a benign enlargement of the male breast as a result of proliferation of the glandular component, is a common phenomenon as it is present in 30–50% of healthy men¹. It is generally attributed to the conditions that disrupt sex-steroid signalling pathways, resulting in increased or unopposed oestrogen action on breast tissues². In general, gynecomastia is observed in three stages during life: (i) the neonatal period where 60–90% of infants have transient gynecomastia due to transplacental transfer of maternal oestrogen; (ii) around 40–60% boys at puberty experience it, which peaks between 13 and 14 years of age and declines in the late teenage years, and (iii) high prevalence is observed among men aged 50–80 years³.

Some medications have been found to alter the ratio of oestrogen to androgen in patients, which results in the appearance of gynecomastia^{2,3}.

However, in males, prepubertal gynecomastia is a rare condition and is thought to be idiopathic⁴. Therefore, search for the source of oestrogen is warranted as gynecomastia at this tender age may embarrass the boy and the family as a whole. Recently, three Caucasian boys aged 4.5, 10.1 and 7.10 years respectively, were diagnosed with gynecomastia at the Department of Pediatrics, University of Colorado School of Medicine, Denver⁴. None had exposure to any known source of oestrogen. The first boy had been applying a compound preparation 'healing balm' containing lavender oil to his skin shortly before the initial presentation of the symptom. The second one was applying a styling gel to his hair and scalp every morning and regularly using a shampoo. Both of these products contained lavender oil and tea-tree oils. The third boy was using lavender-scented soap with intermittent use of lavender scented commercial skin lotion. In all the three cases, discontinuation of these herbal products containing lavender and tea-tree

oils resulted in resolution of gynecomastia⁴.

Further studies using human breast cancer (MCF-7) cells that express oestrogen receptor and human breast cancer (MDA-kb2) cells that express androgen receptor at the National Institute of Environmental Health Science (NIH), MD, confirmed that two oils had oestrogenic and antiandrogenic activities on respective cell lines⁴. Oestrogen stimulates breast tissues and androgen antagonizes these effects. Therefore, gynecomastia is considered to be the result of an imbalance between these hormones^{5,6}. The study therefore, suggests that lavender and tea-tree oils may possess endocrine-disrupting activity that causes an imbalance in oestrogen and androgen pathway signalling⁴. This study further suggested that since the oestrogenic and antiandrogenic activities of these oils are dose-dependent, susceptibility to gynecomastia or other manifestations of endocrine disruption may require exposure to a threshold dose of these oils that may depend on several factors like concentration of oil in the products, duration, frequency and quantity of application and also genetic susceptibility of the person exposed⁴.

In this era of herbal boom, global increase in consumer marketing of herbals and straightforward availability of these products over-the-counter therefore warrant the user to be attentive to any unusual symptom development.

People have been using lavender for centuries. Several clinical and experimental studies have reported beneficial effects of lavender essential oil in many conditions like insomnia, alopecia, anxiety, stress, postoperative pain, and as antibacterial and antiviral agents. It is also used in many traditional therapeutic preparations⁷. Similarly, tea-tree oil also presents a wide variety of biological activities and has been in use since time immemorial⁸. However, according to the Natural Standards⁹, there are still blurred scientific

evidences available to prove their therapeutic claims as well as safety profiles.

Therefore, despite the popularity and wide use of herbal formulations for thousands of years, the belief that herbal Materia Medica could be a viable source of modern drug development, and the global market explosion of over US\$ 60 billion¹⁰, real scientific evidence of their safety and efficacy can be explored only by sincere collaborative efforts of clinicians and the basic science researchers. As herbals are being poured into the market on a daily basis and being promoted and advertised by celebrities only with vested commercial interests, the public basic and clinical research organizations should focus their research attention more in the interest of the public rather than the industrial collaborators.

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