Hypothesis

The potential for oxytocin (OT) to prevent breast cancer: A hypothesis*

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Abstract

This hypothesis proposes that carcinogens in the breast are generated by the action of superoxide free radicals released when acinal gland distension, under the influence of unopposed prolactin, causes microvessel ischemia. Inadequate nipple care in the at-risk years leads to ductal obstruction preventing the elimination of carcinogens from the breast. The regular production of oxytocin (OT) from nipple stimulation would cause contraction of the myoepithelial cells, relieving acinal gland distension and aiding the active elimination of carcinogenic fluid from the breast.

Mechanical breast pump stimulation causes an increase in plasma OT levels in the luteal but not in the follicular phase of the menstrual cycle. OT production upon nipple stimulation in the luteal phase of premenopausal, non-lactating women may be protective against the high rates of mitotic breast cell division noted at this time via the potential to block the effect of oestrogen.

The epidemiology of breast cancer suggests that lengthy lactation time is beneficial. Sexual activity in nulliparous women also protects and OT levels have been shown to rise with orgasm in women and in men. OT systems in the brain are intricately linked to oestrogen and progesterone levels, and it is possible that these hormones may modify the OT secretory response both centrally and through an effect on the sensitivity of the breast.

OT production with nipple care and in sex and lactation, and the reduction in cycling ovarian hormones that occurs with pregnancy, may all be important preventative factors in the development of breast cancer both pre- and post-menopausally.

Hypothesis

This theory states that inadequate nipple care in the at-risk years, leads to ductal obstruction which prevents the elimination of carcinogens from the breast. It is proposed that carcinogens are generated by the action of superoxide free radicals released when acinal gland distension, under the influence of unopposed prolactin, causes microvessel ischemia [1].

Nipple care is an accepted practice during lactation and could be extended into the post-reproductive, premenopausal and postmenopausal years. The regular production of OT from nipple stimulation is a key factor in this notion of breast cancer prevention [2] (Fig. 1).

Historical evidence

Hippocrates associated the origin of breast cancer with the cessation of menstruation. Such suppres-
sion would lead to breast engorgement nodules and ‘hidden’ cancer [3]. He and Soranus also advocated the ‘cupping’ of the breasts to produce uterine contractions to treat postpartum bleeding, heavy periods and engorged breasts [4, 5].

In the sixteenth century, Wilhelm Fabry believed that the cancer began with a drop of milk curdling within the breast [6]. This ushered in ideas about scirrhus and cancer being the outcome of a sluggish thick humour of bile which originated outside the liver. Notions of ductal obstruction appeared following Harvey’s discovery of the circulation in the seventeenth century. Bartholin discovered the lymph flow and Dionis attributed cancer to a stagnation of lymph in the breast [6]. This stasis could be brought about by external trauma or internal noxious constituents in the blood. Many of Dionis’s patients were nuns. It was Ramazinni in 1700 who showed that nuns had a high risk [7].

In the early eighteenth century a Lancashire physician, Edward Baynard, complained that women who wanted to be fashionable with squashed breasts and flattened nipples due to their hard lacing, were at risk from scirrhous cancers and hard tumours [8]. Charles White of Manchester equated tight boned dresses with flat non-responsive nipples with breast disease ‘ the tightness of the stays is alone to do much harm. Hence it would appear evident why women of rank meet difficulty in giving suck to children – and why hard working labouring women, who are obliged to go very loose about their breasts, generally make good nurses’ – [8]. So it would seem that the social class differences then were as relevant for functional breast behaviour as they are today.

**Clinical evidence**

An important clinical finding in some women who present for routine breast examination is a flat, atrophic, and sometimes scaly nipple [9]. This sign indicates that nipple care or stimulation has been absent for at least a year with the likelihood of lactiferous duct obstruction high. Studies in Adelaide suggest that the pain and lumps of hormonal mastopathy can be resolved in about three menstrual cycles with appropriate counselising which advocates options of various kinds of nipple care, particularly when there is a partner [10]. Another clinical observation from this work is that young women who wear tight bras for twenty-four hour periods and