

THE SEBOTROPHIC EFFECT OF PREGNANCY

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Abstract. The sebum excretion rate (SER) in forehead skin was measured in late pregnancy and 8-20 weeks after delivery in 43 women. There was considerable individual variation but the mean SER during pregnancy was significantly higher than in a control group of non-pregnant women and it showed a large and significant decrease to the control level after delivery. This suggests that a powerful sebotropic hormone is secreted during pregnancy. The mean SER during pregnancy in women with twins or triplets was no greater than the mean SER in women with a single foetus. This suggests that the sebotropic factor of pregnancy is unlikely to be of placental origin, and is in keeping with the idea that the sebotropic factor may come from the pituitary.

Key words: Sebum; Sebum excretion; Pregnancy; Sebotropic hormone

We have previously shown that sebum excretion increases during the last trimester of pregnancy (2) and since oestrogens suppress sebum production, we suggested that this must have been due to the production of a powerful sebotropic stimulus during pregnancy. This sebotropic factor could have come from the placenta. Placental hormone production is related to placental size, which is in turn proportional to the number of foetuses. We have now investigated this possibility of a placental sebotropic hormone by studying women with multiple foetuses to see whether the increased levels of placental hormones in these women caused a disproportionate increase in their sebum production.

MATERIALS AND METHODS

We studied 43 pregnant women aged 19-37 years (mean 27) of whom one had mild acne vulgaris. The sebum excretion rate (SER) from both sides of the forehead was measured in each patient by the method of Strauss & Pochi (15) as modified by Cunliffe & Shuster (8) during the last 8 weeks of pregnancy (mean gestation at time of measurement was 38 weeks), and again 8-20 weeks after delivery. Twins or triplets were delivered to 10 of the 43 women and the remainder had one baby each. Women who breast-fed their babies were excluded from this study and the results obtained in these women have been reported elsewhere (7).

All the sebum collections were made in the afternoon because there is a circadian variation in sebaceous activity (3) and possible seasonal variations in sebaceous activity were compensated so far as possible by staggering the observations over a period of 2 years. The patients received no drugs other than laxatives, antacids and hematinics during pregnancy. Only one of the women was taking an oral contraceptive at the time of the post-natal SER measurement, and lactation was not suppressed by hormonal or other medication, even though the women had elected not to breast-feed.

The SER was also measured in 24 non-pregnant control women aged 20-39, none of whom had acne.

RESULTS

There was considerable variation in the results from different individuals. The mean SER during and after pregnancy in the two groups and in control women are shown in Fig. 1. In the group with a single baby the mean SER during pregnancy ($0.82 \pm$ S.E. $0.10 \mu\text{g}/\text{cm}^2/\text{min}$) was significantly higher than in the control non-pregnant group ($0.49 \pm 0.04 \mu\text{g}/\text{cm}^2/\text{min}$). In the post-natal period their mean SER decreased significantly ($p < 0.002$) to the control

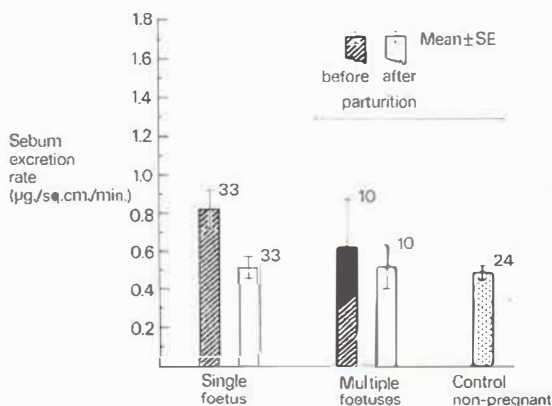


Fig. 1. Effect of pregnancy on sebum excretion in women with a single foetus and women with multiple foetuses.

level ($0.49 \pm 0.04 \mu\text{g}/\text{cm}^2/\text{min}$). In the women with multiple foetuses the mean SER during pregnancy ($0.63 \pm 0.24 \mu\text{g}/\text{cm}^2/\text{min}$) was slightly lower than in the single foetus group, although the difference was not significant ($p > 0.05$), and after delivery their mean SER too decreased to the control level ($0.52 \pm 0.12 \mu\text{g}/\text{cm}^2/\text{min}$).

DISCUSSION

The present study has shown that in a large group of women the mean SER during the last trimester of pregnancy is significantly greater than it is 8–20 weeks after delivery. This agrees with our previous study (2) in which serial measurements during and after pregnancy in 10 women showed that the SER after delivery fell to about 60% of the level during pregnancy.

The only other study we can find in the literature is that of Brun & Ritz (1) who reported that a group of pregnant women produced less sebum than a similar group of control subjects. They used the colorimetric osmic acid method to assay sebum production and this is only semi-quantitative.

We should also point out that in our series the increase in SER during pregnancy was apparent only from the mean change and of the 78 pregnant women we have studied altogether (14), the SER has been greater after delivery in 27.

Our observation that sebum production is increased during pregnancy, at a time when oestrogens are being produced in quantities of the order of 200 mg per day (10), suggests that a powerful sebrotrophic stimulus is produced during pregnancy. This sebrotrophic factor is unlikely to be chorionic somatomammotrophin (HCS, formerly called placental lactogen) since serum HCS levels are usually elevated in twin pregnancies (11), whereas we found the mean SER to be slightly depressed in women with twins, compared with that in women with a single foetus.

The nature of the sebrotrophic hormone of pregnancy remains conjectural, but we have recently reported that in women who breast-feed, the sebum excretion rate does not decrease in the post-natal period (7). This suggests that suckling leads to further secretion of the sebrotrophic factor, and there is additional evidence from studies in both rat and man that this sebrotrophic factor is likely to be of pituitary origin (14). In Parkinsonism the associated seborrhoea is induced by excessive secretion of a pituitary

sebrotrophic hormone under inhibitory control (4, 5, 6). This could be either prolactin or melanocyte-stimulating hormone and we have recently summarised our evidence for believing that the pituitary sebrotrophic factor in Parkinsonism is likely to be an MSH-like peptide (13). The effect of pregnancy and lactation on sebum production could therefore be similarly explained, for MSH excretion increases during pregnancy (9, 12) and in the rat, suckling causes release of MSH from the pituitary (16, 17). However, prolactin excretion also increases in late pregnancy and during suckling, and although prolactin has no sebrotrophic effect in the hypophysectomized or intact rat (14, 18), the effect of prolactin on SER in the human is not known. We cannot therefore exclude a sebrotrophic function for prolactin in the human.

ACKNOWLEDGEMENTS

Thanks are due to the nursing and medical staff of the Princess Mary Maternity Hospital, Newcastle-upon-Tyne for their kind cooperation. Thanks are also due to the Medical Research Council and the Wellcome Trust for financial support.

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Received August 9, 1974

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