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SEBORRHOEA CAPITIS INFANTUM

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In this short paper I propose to discuss the etiology of a common seborrhoeic skin disorder as it occurs in infants, the so-called 'cradle cap' or 'milk crust' of popular usage, and to advance a satisfactory method of treatment.

Dermatologists have divided seborrhoea of the skin broadly into the oily and the dry forms and, as is so often the case, have confused the nomenclature by attaching different names to the one condition; so that we have the oily form of seborrhoea called *hyperidrosis oleosa* by Brocq, *seborrhoea simplex* by Unna, and *stearrhoea simplex* by Wilson, to give only three. The dry form of seborrhoea is pityroid and dry and scaly, or dry and crusting. The condition as it occurs in infants is also seen in adults but I shall limit my description and discussion of it to the infant age-group and shall use the term *seborrhoea capitis infantum* to include both the oily and dry forms.

The oily form is characterized by a waxy-hard crusting of the sebum exuded upon the scalp and near parts. This crusting or inspissation of the excess of sebum mats down any hair that may be present. The colour of this crust or cap tends to vary according to the complexion of the infant but often it has a plainly dirty appearance and, when the parents are careful people, this apparent lack of cleanliness on their part can be most distressing. It is chiefly this that provokes them to ask for medical advice. The more usual methods of treatment for removal of the crust, such as the application of shampoos and unguents, bring only transient benefit, for the crusting reappears as often as it is removed by these means, and may continue to do so for many months. The dry, scaly, pityroid form is not so bothersome but it can be severe enough to demand attention.

It has been said that the waxy or oily form is physiologically represented by the vernix caseosa of the newly-born infant but this is true only in part—sebum is only one of several ingredients which constitute

vernix caseosa. Published opinion has gone so far as to state that the 'milk crust' of the later months of infancy is a persistence of dried vernix caseosa on the scalp. This would be surprising, because it is in the nature of vernix caseosa to disappear from the baby's body if it is left untouched and, secondly, actual deliberate removal of the vernix and thorough cleansing of the skin does not inhibit the development of the seborrhoeic manifestations.

The foregoing accords with the fact, which perhaps rarely receives its due regard from physicians, especially pediatricians, that the seborrhoeic diathesis is a constitutional factor in the infant which cannot be removed. This factor strongly predisposes to the development in later life of premature alopecia if the diathesis is left uncontrolled.

THE ETIOLOGY

Seborrhoea capitis infantum is not in itself an inflammatory skin lesion. It is liable to inflammatory complication from secondary invasion by skin organisms, but primarily it is a metabolic dysfunction of the sebaceous glands, a few of which develop from the epidermis independently of hair follicles.¹ It is the scalp that is first affected by the seborrhoea, which if it become secondarily infected may spread to other parts as a dermatitis. This is brought about by invading skin-organisms which decompose the matted waxy crust, when the products of the decomposition irritate and inflame the skin.

In the literature there is very little interest shown in seborrhoea capitis infantum; some pediatric tomes give it the briefest mention and then only as incidental to a discussion of the related dermatitis.

The study of vitamins has brought a number of facts to light which have a close relationship to clinical medicine. Vitamin B2 (riboflavin) is of special interest in connection with seborrhoea capitis infantum. It is

a growth-promoting vitamin in young animals (mammals) and in them its lack leads to the production of an excess of sebum about the nose, ears and eyes. This excess of sebum can be corrected with food containing sufficient riboflavin.² In young swine a lack of riboflavin results in an exudate of excessive sebum over the back and sides and around the ears and eyes. Riboflavin appears to be needed by all animals and some microorganisms; and lack of it at first retards and later completely prevents growth. Little, if any, storage of riboflavin takes place in the body and it is biologically necessary to renew the intake daily. It is readily excreted in the urine and faeces, and although there is evidence that riboflavin is synthesized in the gut by bacteria it probably leaves the gut with the bacteria. Riboflavin is normally present in the skin of man in minute quantity. Cow's milk contains, on an average, 1.7 micrograms per quart; exposure of milk in bottles to the sun will destroy most of its riboflavin content. A riboflavin supplement for growing pigs is very necessary and they require 3.8 mg. per 100 pounds of live weight.

The suggested requirement of riboflavin for a child of 1 year has been assessed at 0.6 mg. daily.³ Since a mother taking a daily supplement of 3 mg. of riboflavin secretes only 9% of this supplement in her breast-milk it follows that daily addition of the vitamin to the infant's diet is generally necessary for the breast-fed infant. It was a consideration of the facts concerning riboflavin which I have indicated here that led me to the conclusion that a riboflavin deficiency is not unlikely in early infancy and that such a deficiency might explain the appearance of seborrhoea capitis infantum.

THE TREATMENT

On the basis that 0.6 mg. of riboflavin is regarded as the minimal daily requirement for an infant 1 year old (I have not found any mention of the minimal daily requirement for a younger age), I have, from 1950 onwards, prescribed a supplementary daily dosage of 1 mg. of riboflavin for each infant brought to me for the complaint of seborrhoea of the scalp. One difficulty was that 1-mg. tablets of riboflavin were not obtainable. This difficulty persists. However, pharmacists were persuaded to divide 5-mg. tablets into 1-mg. powders and this was found to be a suitable form in which to administer the vitamin in the baby's milk formula if it were being bottle-fed. Unfortunately, the pulverizing of the tablets and their dispensing as powders adds to

the cost. When the pharmacist was unwilling to pulverize and divide the tablets the only objection to giving the whole tablet was the cost.

Very satisfactory results have invariably been obtained after a minimum course of 14 days by this simple method of treatment. When riboflavin was available no other measures were taken or advised to cure the seborrhoea, but the mother often of her own accord removed the scurf or crust by shampoos or otherwise for the sake of an immediate improvement in the appearance of the scalp. Sometimes, after a satisfactory clearing of the seborrhoea from the scalp by supplementary riboflavin, a recurrence, though of slighter degree, has followed the cessation of treatment. A renewal of riboflavin administration only has again cleared the skin and in these cases the mother has been advised to give the extra riboflavin at the first hint of a recurrence. This observation also supports the etiological significance of riboflavin in seborrhoea.

In a few cases which have become secondarily infected, thus deserving the name seborrhoeic dermatitis, local applications of antibacterial agents have been combined with the oral intake of riboflavin to bring about quick healing; when the inflammation has subsided, continuation of the riboflavin supplement has been advised until no trace of seborrhoea remained.

SUMMARY

Facts are submitted indicating the etiological significance of a deficiency of riboflavin (vitamin B2) in the development and continuance of seborrhoea of the skin of the scalp in infants, for which I regard the term *seborrhoea capitis infantum* as appropriate. The condition is in itself bothersome to the parents chiefly because of its unclean appearance, but it often becomes more serious when secondary infection produces an inflammatory dermatitis, which may spread quickly and involve areas of the skin remote from the scalp. The usual ways of treating the seborrhoea are essentially palliative and therefore unsatisfactory. Treatment by supplementary riboflavin given to the infant in small dosage by mouth has given very favourable results.

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3. Food and Nutrition Board (1948): National Research Council Report (USA).