

SUBCUTANEOUS FAT NECROSIS OF THE NEWBORN: CERTAIN ETIOLOGIC CONSIDERATIONS*

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The chief precipitating factors presumably concerned in subcutaneous fat necrosis of the newborn are obstetric trauma and cold exposure (1, 2, 3).

Oleic acid composes 65 per cent of this fat at birth (4) and increases to 86% in the adult. McIntosh et al. (2) state that the low subcutaneous fat olein content is the chief predisposing factor. Knöpfelmacher (5) contended the condition could not develop after six months since the olein content increased after birth and the solidifying point of the fat correspondingly decreased.

For the purpose of considering further the etiologic factors concerned the following case report is recorded.

REPORT OF CASE

L. S., a full term Negro male, was examined at the age of two days. Delivery had occurred spontaneously, and the child appeared normal. Within a few hours several red nodular areas appeared over the shoulders and upper thorax.

Examination revealed several rubbery, elevated plaques present over the posterior trunk and shoulders. A thick, oily liquid was aspirated from one lesion for chemical study (table I). Skin and subcutaneous tissue also were taken from this lesion for a biopsy (Figure I, A & B).

Histopathologic examination of the material revealed a typical picture of subcutaneous fat necrosis. Other findings were normal. Subsequent recovery was uneventful.

COMMENT

The determinations show less neutral fat in the second sample. The iodine numbers of both samples indicate less unsaturated fatty acid present as compared to the normal infant. This agrees with the findings of other authors. The phospholipid and soap contents are somewhat higher than most reported values.

The embryonic fat becomes more and more unsaturated and develops a progressively lower melting point. This is not completed at birth, as the melting point of the subcutaneous fat is still usually higher than 98.6°F. (6).

Since the unsaturated fat content of these lesions is less than that normally expected, a metabolic abnormality in the development of the unsaturated fats of the subcutaneous tissue may be the essential factor. Obstetric trauma and exposure to cold apparently played no part in producing the lesions of the case herein reported. A disproportionate number of cases of obstetric trauma occur which are not followed by the development of subcutaneous fat necrosis.

Zeek and Madden (7) and Flory (8) reported cases examined at autopsy showing necrosis of the subcutaneous fat and also a similar process involving the visceral fat. They could not conclude that cold and trauma accounted for necrosis of internal adipose tissue.

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TABLE I

Result of Chemical Analysis of Fat Removed from Case

Chemical Examination: Material aspirated from one lesion on the twenty-sixth and fortieth hospital days. Ten grams were utilized. The second sample was more liquid than the first. The material when placed in a vacuum desiccator for four days showed a 70% weight loss (dehydration). The figures in table I are in percentages of the dry weight calculated on that basis. The samples were extracted with alcohol-ether, and the lipids were determined by Bloor's method. Cholesterol was estimated by the digitonin method and found to make up the greater part of the phospholipid fraction. The fatty acids were identified by the lead soap solubility method. The percentages given are for the free acids. The neutral fats were saponified, lead salts made, and a semiquantitative determination of the amounts done. The results revealed a preponderance of oleic, stearic, and palmitic acid in order of decreasing quantity.

	1ST SAMPLE	2ND SAMPLE
Neutral fats.....	45-55%	30-45%
Insoluble soaps.....	3-5%	3-5%
Iodine numbers.....	68	38-46*
Phospholipid.....	5%	3-6%
Fatty acid present: Oleic, Stearic, Palmitic.....	3%	5%

* Theoretically the iodine number of the second sample should have been higher.

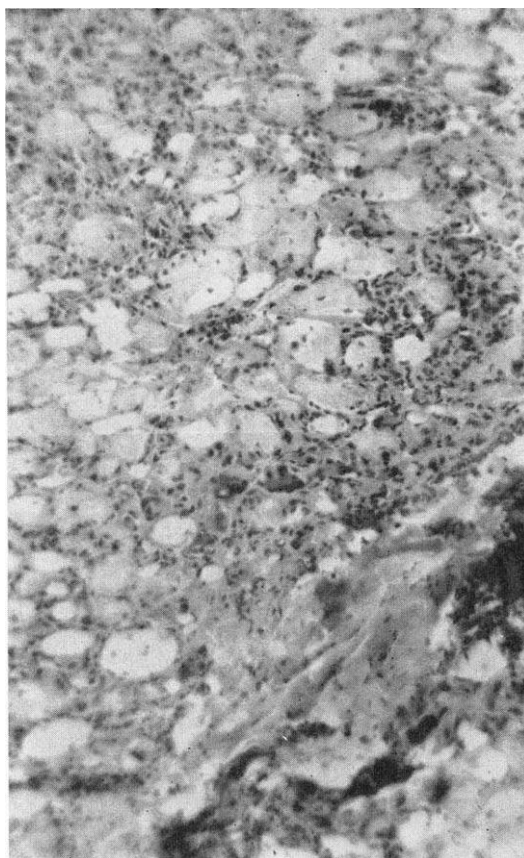


FIG. 1 A

FIG. I. A. Section through the subcutaneous fat showing the infiltrating cells in the necrotic fat. Some of the necrotic fat is calcified. Hematoxylin-eosin stain: $\times 187.5$.

B. High power magnification of a part of A showing the foreign-body type giant cells. Needle-like crystals could be noted in some of the giant cells and abnormal fat cells. Hematoxylin-eosin stain: $\times 512.5$.

SUMMARY AND CONCLUSIONS

Subcutaneous fat necrosis of the newborn may be due to arrested development in fat metabolism. This seems more plausible than attributing the disease to obstetric trauma or cold exposure. Although these two physical factors may act as precipitants, in the case reported herein, it is doubtful that either was contributory.

Dr. Hans Neurath and Dr. Philip Hitchcock cooperated in this study.

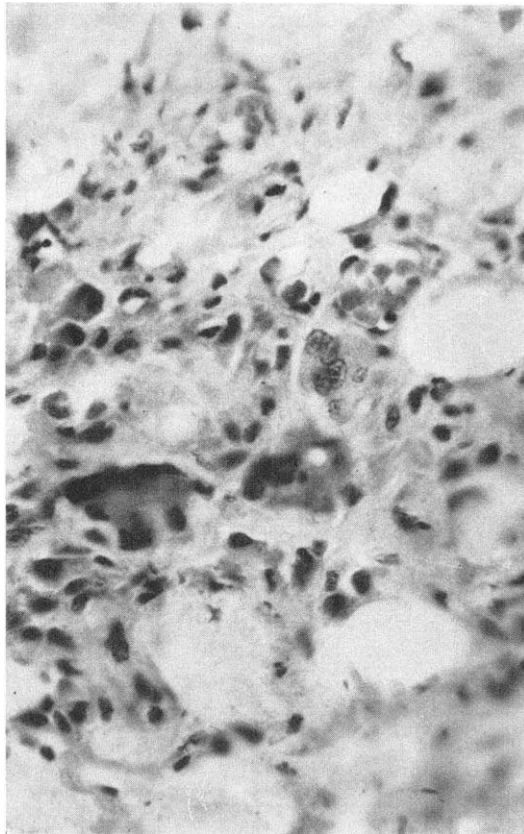


FIG. 1 B

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