

STUDIES IN NEONATAL DIAPER DERMATITIS*

I. The Use of Hydroxyquinoline

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Since Jacquet¹ originally described diaper dermatitis in 1886, there have been many articles concerning the etiology, prevention, and treatment of this condition. Several articles have recently appeared which favor the hypothesis that *Candida albicans* is a frequent cause of diaper dermatitis.^{2,3}

In the study to be reported, an anti-yeastic agent containing 5-chloro-7-iodo-8 hydroxyquinoline (Vioform and 1 per cent hydrocortisone in a petrolatum base was applied to the gluteal area of newborn infants with each change of diaper to see if neonatal diaper dermatitis could be prevented with this agent.

Methods and Material

The studies were conducted in the nursery of the Episcopal Hospital. One hundred and forty-five full-term infants were studied from birth until the third to fifth day of life. They were kept in the supine position and all received similar diapers, bed linen, and a commercially prepared formula, Similac (R).

Immediately on admission to the nursery, the babies were assigned in strict rotation to receive the ointment, or to be in the control group. Each day the babies were completely undressed and examined under a bright light and evidence of dermatoses in the diaper area was noted. Erythema, macules, papules, and maceration in the diaper area were classified as diaper dermatitis. Generalized skin rashes which extended into the diaper area were not noted. Severe diaper rash was noted if extensive maceration, ulceration, or a hemorrhagic dermatitis was present. Moderate diaper rash was noted if the

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degree of involvement was of intermediate severity, usually erythema and papules; and mild diaper rash was noted if localized erythema was present. The examiners did not know whether the infants being examined had received medication, or were control infants. Patch tests with Vioform (R) were applied to the back of all infants for 24 hours to exclude the possibility that a reaction to the medication might influence the findings.

There were 71 babies in the experimental group, and 74 in the control group. Two infants in the former group were excluded because they were discharged before the third day of life. The test material* was applied with each diaper change, which occurred between four to eight times daily.

Results

Of the 71 infants who received the hydroxyquinoline medication with each change of diaper, 21 (30 per cent) developed diaper dermatitis. In 67 per cent of these cases, the dermatitis was mild; in 14 per cent it was moderately severe, and in 19 per cent it was severe. Of the 74 control infants, 27 (35 per cent) developed diaper dermatitis; in 16 of these, the rash was mild; in nine, it was of moderate severity; and in two, the rash was severe (Table 1). The observed differences were not statistically significant.

Table 1
THE USE OF 3 % VIOFORM (R), WITH 1 % HYDROCORTISONE CREAM
DURING THE FIRST WEEK OF LIFE

	Number of Infants Studied	Incidence of Gluteal Diaper Dermatitis	Severity of Diaper Dermatitis		
			Mild	Moderate	Severe
Infants Receiving Vioform (R)	71	30%	14 (67%)	3 (14%)	4 (19%)
Control Infants	74	35%	16 (59%)	9 (34%)	2 (7%)

(Patch tests with the medication were negative in all instances.)

Discussion

The etiology of diaper dermatitis is controversial, and the treatment is usually symptomatic. Goldstein⁴ reported good results with the use of oral methionine, but others failed to confirm a beneficial effect with this agent.⁵

Silicones,⁶⁻⁷ quarternary ammonium compounds (Diaparene),⁸⁻¹¹ Caldesene powder,¹²⁻¹³ and Bactine¹⁴ have been reported

to be useful for the treatment and prevention of diaper dermatitis. Boric acid (1/20 solution) has also been used to treat diaper rash, but in the face of the many reports that this medication can lead to toxicity it is no longer recommended.¹⁵⁻¹⁶ However, in most instances, controlled clinical studies have not been introduced to support the clinical effectiveness of the various medications, many of which are widely advertised.

Vioform (R) has been shown to have anti-yeastic and anti-inflammatory properties.³ Combined with the anti-inflammatory and anti-pruritic action of hydrocortisone, it was hoped that the agent would help prevent diaper dermatitis. However, this was not found to be the case in the newborns who were studied.

Summary

The usefulness of an ointment containing both anti-yeastic and anti-inflammatory (hydroxyquinoline), and anti-inflammatory and anti-pruritic (hydrocortisone) agents for preventing neonatal diaper dermatitis was explored. The observations on the 145 infants who were enrolled in a controlled clinical study are reported. There were no significant differences in the incidence of diaper dermatitis between the control and experimental groups of infants.

Patch tests showed no evidence of sensitivity to the medication.

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