Degree of Infection (Percentage of Erythrocytes Parasitized) by P. berghei in Rats Maintained on Different Diets

Day after Inoculation	Normal Diet		Milk		Milk plus P.A.B. 1/1,000	
	Rat A	B	C	D	E	F
7	1	5	0	0	4	2.5
12	6	20	0.5	0	10	8

parasitized cells each. The degree of infection is expressed as the percentage of red cells which contained parasites.

These investigations are being continued, and it has been found that P.A.B. also corrects the inadequacy of a milk diet for *P. cynomolgi* infections in monkeys. Meanwhile it is concluded that P.A.B. (or some derivative) is an essential metabolite for *P. berghei*, and that the suppressive action of a milk diet upon this infection is due to the deficiency of P.A.B. which it produces.

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A TRIAL OF GOATS' MILK IN ECZEMA IN CHILDHOOD

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It is undoubted that pruritus, erythema, and urticaria may result from dietetic factors, which may thus aggravate a pre-existing eczema or perhaps determine a subsequent eczematous reaction. That diet may be responsible for a true eczema, either by allergy or by any other mechanism, is very doubtful, though claims are often made to the contrary. It was decided to carry out, during the first half of 1952, a controlled trial of the therapeutic effects of goat's milk in children with eczema, in order to test the substance of past and current reports. The report by Harris (1952) was the apparent cause of the letter in this *Journal* by Croft (1952).

Present Investigation

Nine children, unselected successive admissions to the dermatological beds in the General Infirmary at Leeds, were used. A further child was given an incomplete trial, and two more were treated as out-patients; these three children are not described further, although their behaviour tended to confirm the findings in the controlled cases. By having the patients in hospital it was possible to control their diets fully and to make a close supervision of their progress; however, it had the disadvantage that our youngest patient was aged 16 months, since infants with eczema are very rarely admitted to hospital.

Of the nine children submitted to tests, all but two had developed eczema in infancy. Their ages at the time of

the trial, with ages at onset of the condition in parentheses, were: Case 1, 23 months (1 month); Case 2, 2 years ("present at birth"); Case 3, 2 years (3 weeks); Case 4, 4 years (1 month); Case 5, 5 years (2 years); Case 6, 5 years (3½ years); Case 7, 8 years (3 months); Case 8, 8 years (5 months); Case 9, 11 years ("since infancy"). All were male except Case 9. All were of the "disseminated neurodermatitis" type except Case 9, who showed seborrhoeic features; Cases 5 and 7 had considerable superimposed infection; and Case 7 also had xeroderma and asthma.

The trials consisted in the complete substitution of goats' milk for cows' milk in all items of diet, including cheese, etc., for a period of two to five weeks after an initial control period of 2 to 19 days (average one week), and then the reversion to cows' milk. Cases 4, 5, and 7 had second courses of goats' milk after reversion to cows' milk for one to two weeks. Apart from this, treatment was along usual lines for such cases—for example, Lassar's or White's tar paste externally, and mild internal sedation and removal from the home environment (though daily visiting is allowed). With the exception of Cases 2, 3, and 5, who were only scratch-tested, every patient had both scratch tests and patch tests to goats' milk and to cows' milk (including the child, aged 16 months, who received an incomplete trial).

Results.—Cases 2, 3, 5, 6, 8, and 9 showed gradual improvement, unaffected by change of milk. Case 1 had a temporary exacerbation one day before reversion to cows' milk, otherwise his course was one of steady amelioration. Case 4 was rather resistant to treatment, and ran a variable course, apparently unaffected by changes of milk; he had two courses of goats' milk, each lasting two weeks. Case 7 had a relapse on the seventeenth day of his first (three-weeks) course of goats' milk, followed by some improvement, and no immediate exacerbation on reversion to cows' milk; but on the ninth day of cows' milk his condition became worse for a few days. After two weeks on cows' milk he was put back on goats' milk, and the steady improvement was not halted by reversion to cows' milk two weeks later. All the scratch tests and patch tests were negative.

Comment

The chemical composition of cows' milk and goats' milk are very similar, though long usage of goats' milk in infants has been reported as causing a macrocytic anaemia, probably due to folic acid deficiency. The proportion of lactalbumin is higher and the curd tension lower in goats' milk, but it is said to be no more readily digestible than cows' milk (Jeans and Marriott, 1947). Goats' milk could have a therapeutic effect in various ways: (1) by replacing cows' milk, which may contain an allergen—Hill (1938) found that 26 of a series of 100 cases of infantile eczema gave positive scratch tests to milk; (2) by the correction of a deficiency of some trace element or factor—for example, biotin (Kiessling, 1952); or (3) via an action on the gastro-intestinal flora or the digestive processes, perhaps linking up with the work of Towle and Talbot, and White (quoted by Ormsby and Montgomery, 1947).

It was therefore decided to do a simple clinical trial, while at the same time carrying out scratch and patch tests to cows' and goats' milk. These tests were done because most of the reported successes in dietetic treatment of infantile eczema suggest an allergic basis. While scratch tests are supposed to give more positive reactions, particularly in food sensitizations, patch tests are a more reliable criterion of epidermal sensitivity (Peck and Salomon, 1933). However, there are those who declare that in neurodermatitis, as opposed to contact dermatitis, the shock organ is the blood vessel of the cutis, and not the epidermis (Urbach, 1946). Others—for example, Cooke *et al.* (1946)—say that scratch tests are valueless in eczema (allergic dermatitis). For these reasons both scratch and patch tests were done. Bencard scratch-test solutions were used; in the patch tests, lint moistened with the solution was applied for 24 hours to the unprepared skin, on areas of the back or arms as

normal as possible (these were never far from some fairly typical eczematization). Readings were taken after 24, 48, and 72 hours.

Conclusion

Under the conditions of the trial, goats' milk, as such, had no effect on the course of the eczema in nine children. None of these patients showed cutaneous hypersensitivity with scratch or patch testings to cows' or goats' milk.

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Medical Memoranda

Orchitis as a Complication of Chicken-pox

Orchitis as a complication of chicken-pox seems to be rare. Wesselhoeft and Pearson (1950), in a search of the literature, found only one case of orchitis and epididymitis arising in the course of chicken-pox, and report a case of their own.

The case (Case 1) cited by Wesselhoeft and Pearson was described by Sabrazés (1927). A man of 20, vaccinated against smallpox some months earlier, broke out in the rash of chicken-pox, chiefly on the arms and legs, on December 24, 1917. Fatigue, vague joint pains, and fever rising to 37.8° C. (100° F.) occurred. Almost from the beginning he complained of pain in the right testicle, which, along with the epididymis, became swollen to the size of a hen's egg. The left testicle and epididymis were similarly affected, and thereafter remissions and exacerbations of the pain and swelling accompanied by fever affected the testes in turn over a period of 18 days. Fluid appeared in the right scrotal sac on December 29. On January 11, 1918, the temperature finally fell to normal and the testes rapidly diminished in size and tenderness. There is no mention of their subsequent fate.

Wesselhoeft and Pearson's case (Case 2) related to a 46-year-old salesman exposed to the disease in his own home 17 days before the onset. He developed a typical rash and a virus type of pneumonia, and was severely ill. He was treated with penicillin and streptomycin and steadily improved; but nine days after the onset he felt pain in the right testicle, which became swollen and tender, with enlargement of the epididymis. His temperature rose to 102° F. (38.9° C.). The degree of orchitis was thought to be moderate, for the testis never became hard, was at no time seriously painful, and was swollen only to about double its original size. At the end of a week it had returned to normal. Six and a half months after the onset of the illness the right testicle was found to be one-third smaller and was softer and less sensitive than the left. The authors describe this as the first case of partial atrophy of the testicle ever reported as a result of orchitis complicating chicken-pox.

In view of the rarity of orchitis as a complication of chicken-pox, or at least the infrequency with which it has been reported, it seems worth while to describe the event in an English schoolboy (Case 3).

CASE REPORT

On June 23, 1950, a boy aged 7 broke out in a rash having the unmistakable characteristics of chicken-pox. The eruption was extensive. Successive crops appeared during the next few days on the trunk, and to a lesser degree on the limbs. There were spots on the scrotum, prepuce, and umbilicus, but not on the palate. Constitutional symptoms were mild to begin with, but on June 25 the patient complained of abdominal colic, and the next day became seriously ill. He vomited continuously for three hours, and severe abdominal pain was felt in the region of the umbilicus and in both iliac fossae, and generalized abdominal tenderness was maximal in the left iliac fossa. The appearance was toxic. His temperature was raised to the neighbourhood of 100° F. (37.8° C.) and the pulse to about the same figure.

On June 28 he was still extremely ill, but the abdominal pain was less severe. Constipation was absolute. The left testicle and epididymis were acutely painful and swollen to about four times the normal size. He was given 300,000 units of procaine penicillin daily and 0.5 g. of sulphadiazine every four hours.

On June 30 he was seen in consultation. He remained ill and nervous, but the psyche was clear, though he was toxic and drowsy if left alone. His temperature and pulse had returned to normal and the orchitis had begun to resolve, but the testis was still considerably enlarged. Slight tenderness and muscular defence remained only in the region of the umbilicus. He complained of severe pain in his elbows and held his arms tightly flexed. The muscles of the upper limbs were found to be spastic, and could not be straightened voluntarily or passively on account of the pain. The lower limbs were also spastic, while the neck was stiff and painful on attempted flexion. The state of the deep reflexes was difficult to determine, as the boy was very apprehensive. There was no evidence of cranial nerve involvement. The spasticity of the limbs became even more pronounced on the next two or three days, and the mother noticed facial tremors on one occasion. The neurological findings were suggestive of encephalitis. A lumbar puncture was not done, as the boy was in the care of his mother at home.

Chloramphenicol, 500 mg., was given four-hourly from June 30. This was stopped after 36 hours because of vomiting. Within 12 hours from the start of treatment there was a rapid improvement. The spasticity gradually disappeared, and the orchitis subsided in two or three days. On July 2 the appetite returned and the bowels opened naturally. The last vestiges of the rash were gone in 28 days. The patient was seen at intervals thereafter. On January 1, 1951, it was apparent that the left testicle was completely atrophied. He had been quite healthy before the onset of the illness apart from childhood ailments, including an attack of mumps at 2 years of age.

COMMENT

The salient features of the three cases are shown in the Table. It seems that orchitis as a complication of chicken-

Case No.	Appearance of		Testicles Involved	Duration of Inflammation	Specific Treatment	Sequel Testis
	Rash	Orchitis				
1 (French)	Day 1	Day 1 or 2	Both	18 days	Nil	Unknown
2 (American)	„ 1	Day 9	Right	7 „	„	Partial atrophy
3 (English)	„ 1	„ 5	Left	5 „	Chloramphenicol	Complete atrophy

pox has no special characteristics. White blood counts in Cases 1 and 2 were not significant. The efflorescence and systemic illness were pronounced in each case. The duration of the inflammation was shortest in Case 3, whether or not chloramphenicol had anything to do with it.

Orchitis is best known as a complication of mumps, though it occurs in other infectious fevers, in rheumatism, congenital syphilis, and a few other conditions. It is very