

## MAGNESIA AND ALKALINE CARMINATIVES IN INFANCY\*

BY

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Whilst investigating cases of idiopathic hypercalcaemia with failure to thrive, a history was frequently obtained of prolonged intake of magnesia and sometimes of other alkaline preparations. These had been given for the constipation that is such a regular feature of this disorder. It was first thought that the taking of these preparations might have some significance in the aetiology (Creery, 1953), but further consideration did not confirm this view (Creery and Neill, 1954). Carré, Wood, and Smallwood (1954) came to a similar conclusion regarding magnesia and idiopathic renal acidosis in infancy. The present survey has been carried out to gain information on the incidence of this type of medication in infancy.

**Method.**—The mothers of 200 children who attended the B.C.G. Vaccination Clinic of the Royal Belfast Hospital for Sick Children during a period of six months in 1953 were interviewed. The children were drawn from the age group of 6 months to 3 years, the majority (138) being between 12 and 18 months of age. There were 104 males and 96 females, and all were apparently healthy.

The medication given fell broadly into two groups: (a) preparations containing magnesia, and (b) alkaline carminative mixtures. Information was also obtained about the use of teething powders.

### (a) Magnesia

Magnesia had at some time been given to 158 (79%) of the children. The type of preparation, pH, titratable alkalinity, and frequency of dosage are shown in Table I. From

TABLE I.—Magnesia. Frequency of Dosage

Preparation	Occasional (Once Weekly or Less Often)	Regular (Twice Weekly or More Often)	Daily for More than 2 Weeks	Daily for Less than 2 Weeks	Total
A Magnesium hydroxide, 8.45% solution; pH=11; titratable alkalinity (T.A.)=2,700 mEq/l. (Proprietary)	53	25	11	3	92
B Magnesium hydroxide, 6.5% solution; pH=10; T.A.=2,650 mEq/l. (Available at infant welfare clinics)	18	9	2	1	30
C Magnesium bicarbonate, 2.5% solution; pH=8; T.A.=388 mEq/l. (Proprietary)	11	8	9	2	30
D Other preparations (powdered magnesia, magnesia, and paraffin, etc.)	4	1	1	—	6
Total	86	43	23	6	158

this it will be seen that 86 infants received only occasional doses of magnesia (commonly a teaspoonful at a time), 6 received it daily for less than two weeks, and 66 had it regularly or daily for longer periods. In the last group, 6 had been given magnesia from birth; the majority (49) had been started during the first six months. Of those receiving regular medication (43), the duration of therapy had been 2–6 months in 10 cases, 7–12 months in 20, 13–18 months

\*Based on a paper read at a meeting of the Ulster Paediatric Society on October 22, 1954.

in 7, and in excess of 18 months in 4; the duration was not stated in 2. A common weekly dosage was in the region of 1–3 teaspoonfuls (37 cases).

Of the 23 infants in the daily group (more than two weeks), the duration had been 1½–3 months in 11 cases, 4–6 months in 6, 10–16 months in 3, and for periods in excess of 18 months in 3. The most usual daily dosage was 1 teaspoonful (12 cases); 7 infants had from 1½–4 teaspoonfuls daily and 4 had only ½ teaspoonful daily.

**Indications.**—In 127 cases magnesia had been given for regulation of the bowel movement or for the relief of alleged constipation. Of the remainder, the most frequent reasons given for its use were teething (9), wind (4), vomiting (4), digestive upset (3), fretfulness (2), and a miscellaneous group (7) comprising such vague statements as “out of sorts,” “dirty mouth,” “to cool him,” “good for him,” etc. In two cases no indication was given.

**Recommendation.**—Sixty-seven of the mothers stated that they had started treatment on their own initiative, and 43 said they had acted on the advice of the welfare clinic doctor, sister, or health visitor. Twenty had been so advised by female relatives (usually the grandmother), 14 by their family doctor, 8 by friends and neighbours, and 6 by dispensing chemists.

**Results.**—Of the 158 mothers, 143 thought that the treatment had produced the desired result, 6 were of the opposite opinion, 4 were doubtful, and in 5 cases no satisfactory answer was received.

**Infant-feeding.**—Of the 200 infants, 70 (35%) were said to be still receiving breast milk at 3 months of age. This compares with a recent estimate, for the same age, of 37% of 500 Belfast infants (Campbell and Cheeseman, 1954). In view of the small number of infants who had not received magnesia (42) comparison between the infant-feeding figures of the two groups (“magnesia” and “no magnesia”) has not been attempted.

### (b) Alkaline Carminative Mixtures

Mixtures of this type had been given to 133 of the children. Of those who had been given magnesia (158), 107 also had carminatives; and of those who had no magnesia (42), 26 had them. The details of the mixture, pH, etc., are shown in Table II. From this it will be seen that these remedies are much less alkaline than are the magnesia preparations. Forty infants received only an occasional dose, 23 had it regularly, and 70 had it daily for more than two weeks. In the “regular” and “daily” group (93) 12 infants had received the mixtures from birth, 18 were started on them during the first month, 50 were started at the age of 1–3 months, and 13 at 4–6 months. Of the infants in the “regular” group (23), the duration of therapy had been 1–3 months in 10 cases, 3½–6 months in 4, 8–12 months in 6, 13 months in 1 case, and the duration was not stated in 2 cases. A common weekly dosage was 2–3 teaspoonfuls (16 cases). Two infants had as much as 9 teaspoonfuls weekly. Of the 70 infants in the “daily” group, the duration had been ½–3 months in 34 cases, 3½–6 months in 14, 7–12

TABLE II.—Alkaline Carminatives. Frequency of Dosage

Preparation	Occasional (Once Weekly or Less Often)	Regular (Twice Weekly or More Often)	Daily for More than 2 Weeks	Total
A Ol. anethi, 2 minims (0.12 ml.). Sod. bicarb., 20 gr. (1.3 g.). Spirit rectif., 94 minims (5.6 ml.). Syr. simplex, 9½ dr. (37 g.). Aq. dest., ad. 4½ oz. (130 ml.). Dose: 1–3 teaspoonfuls. pH=9. T.A.=100 mEq/l. (Proprietary)	20	19	37	76
B Similar to above but without spirit. pH=9. T.A.=150 mEq/l. (Proprietary)	15	4	27	46
C Both of above	—	—	5	5
D Other and unspecified mixtures	5	—	1	6
Total	40	23	70	133

months in 14, and over 12 months in 5 cases. The duration was not stated in 3 cases. The usual order of daily dosage was 1 (39 cases) or 2 teaspoonfuls (20 cases). Five infants had  $\frac{1}{2}$  teaspoonful daily, 2 had  $1\frac{1}{2}$ , and 4 had 3 teaspoonfuls daily.

**Indications.**—In 90 cases these carminatives had been given with a view to alleviating "wind." In 20 cases the indication had been colic, abdominal pain, or cramp; in 6 hiccup; in 5 crossness or crying; and in 4 teething. Other reasons given were "to aid sleep" (2), "for sourness" (1), "to cool her" (1), and in 4 cases no reason was stated.

**Recommendation.**—Fifty-five of the mothers began treatment of their own accord, 33 said they acted on the advice of a female relative, and 20 on that of friends and neighbours. Twelve said they were so advised by the welfare clinic, 8 by their family doctors, 3 by chemists, and 2 by hospital midwives.

**Results.**—Ninety-three of the mothers thought the results of the treatment were good, 29 condemned it, 4 were doubtful, and 7 expressed no opinion.

### Discussion

Despite the retrospective nature and subjective method of this survey the findings in this group of children seem to confirm the clinical impression that the use of alkaline mixtures is common in infancy. In this series 184 (92%) of the children were said to have received some alkali medication at some time; often only an occasional teaspoonful had been given, but in a considerable number of cases the mixtures had apparently been persisted with for prolonged periods.

A remarkable case of marasmus was described by Holt and McIntosh (1940), the infant having been fed exclusively on a magnesia preparation in the belief that it was a food. Nothing of this nature has been encountered during this investigation, and no obvious ill effects can be attributed to these medicaments. This is in contrast to the recently recognized dangers of teething powders containing mercury which have been incriminated as possible factors in the aetiology of pink disease (Gaisford, 1949; Dathan, 1954) and in some cases of nephrosis (Wilson, Thomson, and Holzel, 1952). In the present investigation teething powders of this type were regularly ingested by 22% of the infants: this figure compares with 6.9% in the Manchester region and 37% in Warwickshire, as reported by Holzel and James (1952).

Alkalosis has been considered as a possible complication of prolonged and heavy dosage with those magnesia preparations of high alkalinity, especially where there has been concurrent vomiting. However, in a small number of infants receiving such dosage alkali reserve levels have always been within normal limits.

Although not actively harmful, this habit of dosing infants with alkalis is meddlesome and unnecessary. This being so, it should be discouraged. These medicaments are not expensive and are often given for symptoms which exist only in the imagination of the mother. That their infants should defaecate daily with absolute regularity amounts almost to an obsession with many mothers, and seems to determine the frequent resort to magnesia. The crying and fretfulness so often put down to wind may well be due to unsatisfied hunger (*British Medical Journal*, 1954), for which carminatives are a poor remedy. It is perhaps not generally realized that one of the most popular of these mixtures (preparation A in Table II) contains about 4% of ethyl alcohol, a concentration not far below that of some brands of beer, stout, and cider. This small amount of alcohol, acting as a mild soporific, may possibly serve to allay hunger and provoke sleep with at least a temporary alleviation of the infant's discontent.

### Summary

Of 200 apparently normal infants, 184 (92%) had been given some alkaline mixtures at some time. Magnesia had been given to 158 (79%), generally for

the regulation of the bowels, and 133 (66.5%) had received carminatives, usually for "wind." Both magnesia and carminatives had been given to 107 (53.5%). The main features of this "therapy" are outlined, and its unnecessary nature is stressed. No obvious ill effects are attributed to these medicaments.

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## ABO BLOOD GROUPS AND HYPERTENSION

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Evidence has been advanced suggesting that there is an inherited predisposition to arterial hypertension. The influence of heredity in the development of cerebral haemorrhage was examined by Dieulafoy (1876) and Raymond (1907). Broadbent (1897) and Allbutt (1915) recognized inheritance as a factor leading to essential hypertension. A familial incidence has been shown by Weitz (1923) and Ayman (1933). Platt (1947) found a hereditary factor in 76–86% of cases of essential hypertension, and concluded that this is a hereditary disease conveyed as a Mendelian dominant, with a rate of expression of more than 90%. Thomas and Cohen (1955) have determined the relationship of inheritance of hypertension to the associated conditions, coronary artery disease, obesity, and diabetes.

The examination by Waterhouse and Hogben (1947) and Allan (1953) of fertility and abortion, together with the demonstration by Struthers (1951) of an excess of group A children dying from bronchopneumonia, has been followed by the relationship of ABO groups in cancer of the stomach, by Aird *et al.* (1953). Later Aird *et al.* (1954) have shown that there is a relative increase in the numbers of Group O subjects among those who have peptic ulceration.

We have therefore determined the ABO frequency distribution in a series of patients with essential hypertension.

The majority of the patients in this series (1,790) attended between 1948 and 1954 at the West of Scotland Regional Blood Transfusion Centre for venesection, being referred by their doctors because of hypertension.