Canad. Med. Ass. J.
Sept. 14, 1963, vol. 89

SHORT COMMUNICATION

Clinical Study of Senna Administration to Nursing Mothers:

Assessment of Effects on Infant Bowel Habits

WILLIAM F. BALDWIN, M.D., C.M.,* *Burnaby, B.C.*

ABSTRACT

Fifty nursing mothers were given regular doses of a senna compound (Senokot Granules) and 50 received mineral oil or magnesia (Magnolax) to determine whether senna was an effective laxative and whether senna affected the bowel habits of infants of nursing mothers. Senna laxative was effective in 49 of 50 mothers. Infant bowel habits were not affected by senna administration to nursing mothers. The evidence suggests that the active principles of senna if they are transmitted in breast milk have no effect on the evacuation patterns of nursed infants.

AN extensive review of purgatives and laxatives by MacGregor[1] singled out the anthracenes as the most important drugs for inducing bowel activity, with cascara sagrada and standardized senna preparations specifically listed as the most safe and effective. The author of this review states, however, that emodin, from which the activity in this group is presumably derived, is excreted in breast milk and hence anthracenes should not be used by nursing mothers.

The literature is quite sparse with regard to experimental evidence of the transmission of anthracene drugs in breast milk. What chemical and clinical evidence exists, however, suggests possible differences among the various anthracenes in this regard and is overwhelmingly against the view that the active principles of senna in particular are so transmitted or, if they are transmitted, that they have any deleterious effect on the bowels of newborn infants.

Chemically, the most recent attempt to ascertain whether the active principles of anthraquinone laxatives pass into breast milk, consisting of a series of highly sensitive tests reported by Friebel and Walkowiak[2] in 1951, resulted in negative findings. These investigators concluded that if any traces of the preparations tested were transmitted, they were too small to be identified and too small to affect peristalsis in the nursling. In 1937, a series of chemical tests reported by Tyson and associates[3] demonstrated that cascara was transmitted in breast milk but that senna was not. As early as 1907, Bucura,[4] using the soda lye test for chrysophanic acid in milk, asserted that he found no trace of anthraquinones in the milk of women who had ingested cascara, senna and rhubarb.

No clinical evidence was found in the literature indicating that the employment of senna in nursing mothers affects the bowel activity of the infant. Blumgarten (1941),[5] referring to an old form of non-standardized senna, observed that in nursing mothers "it is excreted in the milk, and it will then act as a laxative in the nursing infant." He did not, however, cite any clinical or chemical evidence to support this statement. On the other hand, there are several reports of the employment of standardized senna as effective therapy for postpartum constipation with no adverse effects observed in nurslings.[6, 7]

The obstetrical department of Burnaby General Hospital, Burnaby, B.C., has been employing a standardized senna preparation* for the therapy of postpartum constipation without encountering any difficulties in the bowel action of nurslings. It was decided, however, to subject the clinical data to more detailed study, particularly in view of the paucity of the literature on this subject and the rather widespread assumption that anthracene laxatives should be avoided in nursing mothers because of the effects of emodin transfer to the nursling.

METHOD AND MATERIALS

The study involved 100 nursing mothers, 50 of whom were given senna in the form of flavoured granules and 50 who comprised a control group who received, with two exceptions, either mineral oil or Magnolax, an emulsion of milk of magnesia and liquid petrolatum. The two exceptions received, on request, glycerin suppositories. The two groups were selected by the process of alternation except where patients requested a specific medication.

All patients in both groups delivered spontaneously except one in the control group who had a Cesarean section. Meperidine (Demerol) and promethazine (Phenergan) were administered routinely prior to delivery to the bulk of the parturients in both groups.

*Chief of Obstetrics and Gynecology at the Burnaby General Hospital, Burnaby, Vancouver, B.C.

*Senokot Granules, supplied by The Purdue Frederick Company (Canada) Ltd., Toronto.

The group who received senna consisted of six primaparas, 26 with one to two children, and 18 with three to five children. The control group contained no primaparas; 33 had one to two children, 14, three to five children, and three had more than five children. Among the groups receiving senna, assessment of bowel patterns prior to pregnancy revealed five patients with a history of constipation and 45 with normal habits. In the control group there was one patient with a history of constipation, one with a questionable history, and 48 who reported normal bowel habits.

In the main, patients in the senna group received one level teaspoonful of the granules, or the total active constituents of 450 mg. of the cassia acutifolia pod, either in the morning or at bedtime of the first postpartum day. If there was no evacuation or inadequate evacuation the next day, another teaspoonful was administered at bedtime. Subsequent administrations, consisting of either half a teaspoonful or a teaspoonful chiefly at bedtime, depended upon bowel response. The control group followed a similar regimen, receiving a tablespoonful of either mineral oil or Magnolax in place of the senna.

All of the infants in both groups received supplemental feedings, either from the day of delivery or the first postpartum day, chiefly in the form of dextromaltose followed by Pablum, except for one infant in the senna group who required no supplemental feeding. In the control group, two infants received parenteral penicillin-streptomycin daily. In the senna group, seven infants received a synthetic vitamin K preparation and three others were given chloramphenical (Chloromycetin) and penicillin parenterally. Two of the latter had exchange transfusions because of erythroblastosis, and the third required resuscitation on the third day.

From birth, records were kept of infant bowel movements, including the number of stools, quality and colour. After elimination of the meconium, up to six bowel movements a day was adjudged normal.[8] More important than the number of movements in evaluating the results, however, was the quality of the stool, which in breast-fed infants is normally quite soft, of a salve-like consistency, and tends to be yellow or gold in colour.[9]

RESULTS

All infant stools in both groups were within the normal range of consistency. In the control group, one infant had a single foul-smelling brown stool on the third day; and in the senna group the stools of two infants were somewhat looser than the others on one occasion each, but still of sufficient consistency to be evaluated as normal breast-fed infant stools. All but one infant in the senna group had six stools or less in any one day. The single exception was an infant with seven movements on the day after the mother's initial ingestion of senna. All movements were of normal consistency and colour.

No effort was made to determine the immediacy of the effects of various medications in the mothers. In the senna group, 44 of 48 for whom stool records were available had normal stools with administration of senna alone while in the hospital, one had diarrhea, one required an enema and two received suppositories prior to their first movements. Of those in the control group, 23 of 30 for whom stool records were available had normal bowel movements with the primary control medication only; five required suppositories when there was no response to mineral oil or magnesia (Magnolax); one responded to magnesia after failure of evacuation with mineral oil, and one had diarrhea.

Probably because of the palatability factor, the greater readiness with which the senna was accepted was impressive.

COMMENT

This type of clinical study cannot by its very nature determine definitively whether there is actual transmission of emodin in breast milk. It can determine only whether or not infant bowel patterns are significantly affected. The results indicated that they are not so affected. This could be because there is actually no transfer of emodin, or because the amount transferred is too small to produce a significant effect.

It is also possible that the senna principles exert their influence in a manner which causes them to be inert under the particular conditions of the infant bowel. These active principles exert their specific effect in the large bowel following cleavage of the senna glycosides by enzymatic action of *E. coli*,[10] which is the predominant inhabitant of the normal adult colon.[11] In nursing infants, however, the prominent flora are Gram-positive bacilli of the *Lactobacillus acidophilus* group, which are not replaced by Gram-negative bacilli of the colon bacillus group until after the child is weaned.[11] It is thus entirely likely that, even if there is a transfer of emodin in breast milk, it cannot exert any influence on the bowel pattern of the nursing infant. Whether or not this is so, the current study confirms the experience of others, previously cited, that ingestion of senna by nursing mothers does not have any observable effect on the infant bowels.

SUMMARY AND CONCLUSION

One hundred parturients, all nursing mothers, were subjected to a clinical study to determine whether senna, a useful laxative in the treatment of postpartum constipation, affects infant bowel patterns through transfer of the drug's active principles in breast milk. The subjects were divided randomly into two groups of 50 each, one of which received senna starting with the first postpartum day, and the other mineral oil or magnesia (Magnolax). Careful records of infant bowel movements were kept, including the number per day, quality and colour. All infants in both groups demonstrated normal bowel patterns. While the study could

Canad. Med. Ass. J.
Sept. 14, 1963, vol. 89

not by its nature determine whether or not active senna principles are actually transmitted in breast milk, the results appeared to indicate that senna ingested by nursing mothers has no observable effect on the infant bowel.

Employed in the form of flavoured granules, the standardized senna was more effective than the control medication in overcoming puerperal constipation, eliminated almost entirely the need for enemas and suppositories, and was readily accepted by the patients to whom it was administered.

REFERENCES

1. MACGREGOR, A. G.: *Brit. Med. J.*, 1: 1422, 1960.
2. FRIEBEL, H. AND WALKOWIAK, L.: *Arch. Gynaek.*, 179: 136, 1951.
3. TYSON, R. M., SHRADER, E. A. AND PERLMAN, H. H.: *J. Pediat.*, 11: 824, 1937.
4. BUCURA, C. J.: *Z. Exp. Path. Ther.*, 4: 398, 1907.
5. BLUMGARTEN, A. S.: Textbook of materia medica, pharmacology and therapeutics, 7th ed., The Macmillan Company, New York, 1937, p. 225.
6. DUNCAN, A. S.: *Brit. Med. J.*, 1: 439, 1957.
7. STEIGMANN, F.: Newer drugs in the therapy of constipation, *In*: Disturbances in gastrointestinal motility, edited by J. A. Rider and H. C. Moeller, Charles C Thomas, Springfield, Ill., 1959, p. 293.
8. PATERSON, D. AND MCCREARY, J. F., editors: Pediatrics, J. B. Lippincott Company, Philadelphia, 1956, p. 75.
9. NELSON, W. E.: Textbook of pediatrics, 7th ed., W. B. Saunders Company Ltd., Philadelphia, 1959, p. 651.
10. Constipation, Treatment: *In*: British encyclopedia of medical practice, 2nd ed., Cumulative supplement, edited by Lord Horder, Butterworth & Co., Ltd., London, 1956, p. 87.
11. TODD, J. C., SANFORD, A. H. AND WELLS, B. B.: Clinical diagnosis by laboratory method, 12th ed., W. B. Saunders Company, Ltd., Philadelphia, 1953, p. 516.

CASE REPORTS

Post-Varicella Encephalitis

A. P. MILLER, M.D., *Langenburg, Sask.*

ENCEPHALITIS as a complication of chickenpox is something of a rarity, and no such cases have been reported in the Province of Saskatchewan for a number of years. The following brief case history is presented as a reminder to physicians in practice that this disorder does occur and should be borne in mind.

An 8-year-old white boy contracted chickenpox in December 1962, during the course of a local epidemic of this exanthem.

The first vesicles appeared on December 3, 1962, and further crops erupted until December 7. The lesions then proceeded to dry up in the normal manner and recovery appeared to be proceeding uneventfully.

On December 9, however, he began to complain of abdominal discomfort and vomited two or three times. Physical examination at this time revealed only the drying crusted chickenpox rash; there was no pyrexia and no abdominal findings to explain the symptoms.

In the course of the next three to four days these symptoms persisted, and he developed gradual onset of headache, vertigo and, finally, ataxia. He was seen on several occasions during this period; there was no pyrexia at any time and neurological examination was non-contributory. With the onset of ataxia, however, the diagnosis of encephalitis was suspected. He was accordingly admitted to Langenburg Union Hospital, Saskatchewan, on December 15, 1962, and given intravenous infusions for 24 hours to correct the moderate dehydration which had developed as a result of the persistent vomiting. On December 16, he was transferred to the Regina General Hospital.

At the time of admission to the Regina General Hospital, neurological examination revealed bilateral nystagmus with a fast component outwards, and a gross degree of truncal ataxia. The Babinski response was equivocal. He showed marked irregularity on the finger-to-nose test, and the heel-to-toe test was performed rather poorly. The boy seemed listless and apathetic; his speech was slow but clear.

The white blood cell count was 5800 per c.mm., with a normal differential count; the sedimentation rate was 23 mm. in one hour; blood urea was 27 mg. % and the serum electrolytes were normal.

The cerebrospinal fluid (CSF) was clear and under normal pressure. It showed only two white blood cells per c.mm.; the protein level in the CSF was 24 mg. %, sugar 75 mg. % and chlorides 120 mg. %. The spinal fluid was negative on culture.

The patient remained afebrile in hospital, and was treated with dimenhydrinate suppositories (Gravol) for nausea and vomiting, together with a vitamin suspension (Mulcin) and vitamin B complex daily.

On this regimen, slow and steady improvement occurred. By December 20, 1962, he was able to stand up at the bedside and walk with support. By December 26, he could take a few steps by himself; and at the time of discharge on December 28, he could walk alone.

The nystagmus disappeared on the third hospital day, and the finger-to-nose test gradually improved throughout his stay in hospital.

He was dismissed with a final diagnosis of post-chickenpox encephalitis with major involvement of the cerebellum. Since that date the boy has made an apparently complete recovery and his parents can detect no residual disability.

SUMMARY

The occurrence and clinical course of a case of post-varicella encephalitis are described.

I am indebted to Dr. O. E. Laxdal, pediatrician, for many of the details of the course of the illness in this patient.