CARBOXYMETHYLCELLULOSE AS A COLLOID LAXATIVE

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The effect of sodium carboxymethylcellulose as a hydrophilic colloid laxative was studied in 250 patients during a three-year period. We were anxious to give this synthetic cellulose gum a thorough clinical trial in spite of the fact that there are so many cathartics already available, since it gave promise of possessing important advantages over any of the others. Our clinical impressions and other observations are summarized below:

1. Sodium carboxymethylcellulose is an effective colloid laxative and is apparently completely non-toxic.
2. Since it produces no roughage to irritate delicate mucous membranes of the gastro-intestinal tract, it is of particular value in patients with irritable or spastic bowels and can be used advantageously in cases of hemorrhoids and proctitis.
3. This synthetic cellulose gum has a marked lubricating property which facilitates defecation. This property may well account for the fact that it produces satisfactory results in much smaller dosage than is necessary with other colloid laxatives.
4. Sodium carboxymethylcellulose is tasteless, odourless and non-toxic. It does not interfere with the absorption of essential nutritional elements, nor does it absorb fat soluble vitamins from the intestinal tract.
5. None of the patients in our series developed intestinal impaction, even though the gum was administered to some patients for many months.
6. In cases of diarrhea, sodium carboxymethylcellulose has an apparent ability to absorb irritating toxins.
7. SCMC appears to be just as satisfactory as currently used antacids and eliminates the usual constipating action of others, especially aluminum hydroxide preparations.

Supplemental Report

Since submission of this manuscript, the follow-up has been extended seven months, so that the longest period of follow-up is now fourteen months in the patients presented. The patients have maintained their improvement while on the drug and followed in the clinic. There have been three recurrences in the patients who stopped using the drug. These three patients have returned and are again getting relief of their symptoms with the drug.

Additionally, twenty more patients are taking the preparation, either by liquid or tablet form, with similar results to the cases herein reported. In all cases, a striking feature has been the absence of constipation and the avoidance, in many instances, of additional laxatives, which were used frequently when other antacids were taken.

In the past 6 months, a smaller tablet, containing 125 mgm. sodium carboxymethylcellulose and 75 mgm. magnesium oxide, has been used. The difficulty in swallowing mentioned in this paper, has not occurred with the smaller tablets which is the size available commercially (Carmethos).

REFERENCES

The gum was first obtainable only in powder and granule form. It is now available in a much more convenient tablet form. It appears to be equally effective in the form, and is, of course, easier for patients to swallow.

Toxicity, Sensitivity and other Studies: Brown and Houghton and Werle found sodium carboxymethylcellulose to be non-toxic when fed in large amounts to animals. Young rats maintained by Rowe et al for a period of eight months on diets containing five per cent by weight of sodium carboxymethylcellulose, equivalent to the ingestion of two to three grams per kilo of body weight per day, manifested no ill effects. Another group of nearly mature female rats were maintained for two months on diets containing twenty per cent by weight of sodium carboxymethylcellulose, equivalent to eleven to thirteen grams per kilo of body weight per day, without the production of any deleterious effects upon organ weights or on histopathological examination. The feces were observed to be softer. A slight growth curve depression, of questionable significance, was noted, this can be explained by the increase in the bulk of the diet to the exclusion of nutrient food.

A comparative study, to determine the acute oral toxicity values in white rats and guinea pigs of sodium carboxymethylcellulose, locust bean gum, edible gelatin, karaya gum, citrus pectin and gum tragacanth, was made by Shelanski and Clark. The results indicated they were all in the same range of toxicity. Daily feedings of one gram of sodium carboxymethylcellulose per kilogram of body weight to white rats for a period of twenty-five months produced no deviation from the control group in regard to fertility, blood counts, urinalysis, weight change, gross and microscopic pathological examination of heart, liver, stomach, intestines, kidneys, spleen and adrenal glands. Approximately 90% of the sodium carboxymethylcellulose fed to the rats was reclaimed in the feces.

It was demonstrated by means of patch tests in two hundred human subjects that sodium carboxymethylcellulose is neither a primary skin irritant nor a sensitizing substance. Five grams of the compound mixed with an antiseptic substance were used in 134 cases of vaginal infection without any evidence of irritation of the vaginal mucosa or external genitalia.

No significant mucosal irritation could be detected in 22 patients who were taking 6 to 18 grams of the colloid laxative daily. Two of these patients had an aversion for jelly-like substances and failed to revert to normal bowel habits. Two of these patients had an irritable bowel syndrome. This phenomenon may have been due to an increase in peristalsis or may have been coincidental with their usual pains. Two markedly constipated female patients apparently derived no therapeutic effect from as much as nine grams of sodium carboxymethylcellulose daily.

It was observed that the average constipated patient started to have normal daily bowel movements in one to three days; the patients with more chronic and marked constipation required larger doses of the laxative and an average of six to ten days to obtain the desired results.

**DISCUSSION**

The increased incidence of serious gastro-intestinal disturbance occurring in many patients today is no doubt due to the habitual use of harsh laxatives or cathartics to stimulate bowel movements. An occasional dose of a laxative or cathartic cannot be condemned, but a constant exposure of the gastro-intestinal tract to the abuse by a cathartic is deplorable and frequently leads to a habit which may result in serious organic disturbances.