

Pathology of Cathartic Colon

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The morbid anatomical changes seen in the colon of 12 purgative addicts consisted of three main features: loss of the intrinsic innervation, atrophy of the smooth muscle coats and melanosis coli.

Most of the patients coming to colectomy for this condition have been taking purgatives for 30-40 years. A large number of the myenteric neurones are lost, with Schwann cell proliferation in the ganglia, the remaining neurones being dark and shrunken with clubbed processes. Two of the 12 cases were under 30 when they had the colon removed, and therefore had a much shorter history. The myenteric plexus in these cases showed a number of pale, enormously swollen but otherwise normal neurones. Extrapolating from animal material, this is the appearance of a grossly overstimulated cell. It suggests that the initial action of the purgative is to stimulate neurones, but that over the course of years they tire and eventually die.

Surgeons who have operated on these cases know that the bowel is thin and baggy. The transverse colon is often pendulous and there is a large dilated sigmoid. The muscle coats in these cases are thin and this can be seen macroscopically and microscopically. It is not just due to dilatation because the physiological response of smooth muscle to stretch and denervation is not atrophy but hypertrophy, as is shown well in Chagas' disease. Another feature seen in 5 out of 12 cases is the presence of excess adipose tissue in the submucous layer. This was described by Morson (Jones 1967) and might also suggest that there is some tissue loss.

Melanosis coli is diagnostic of purgative taking and consists of pigment-containing macrophages in the mucosa. Special stains of this pigment show that it is not melanin but has many of the staining reactions of lipofuscin, a wear-and-tear pigment. It is very likely to be a combination of a pigment of this type with either anthraquinone or one of its breakdown products.

Anthraquinones given parenterally are extremely potent cell poisons even in minute doses. However, it is apparent that the vegetable products of cascara and senna which have been in use for centuries are quite safe. People dying from purgative addiction die from the metabolic side-effects, not anthraquinone poisoning. There are probably two reasons for this. One is that very little of the active principle is absorbed at all, and the other is that much of what is absorbed

is concentrated in the colon, mainly on the right side. Like many neurotoxins, including cyanide and strychnine, they probably stimulate nervous tissue in small quantities, hence the purgative action.

Since they are cell poisons they produce a progressive destruction of the tissue in which they are concentrated, the colon. They affect first the most sensitive cells, the neurones, but later the smooth muscle also suffers damage. Finally, the colon is destroyed as a functioning organ and the surgeon has little alternative but to remove it. An additional problem is that, as this is mainly a disease of the right side, sigmoid colectomy may not prove a permanent answer.

The vegetable laxatives of known safety are considered by the pharmaceutical industry to be too cheap and simple. The anthraquinone derivatives are now being marketed as pure substances, often together with other drugs given to enhance their absorption. As expected, since they are cell poisons, this makes them much more toxic. For two products on the market in this country, the lethal (not the toxic) dose, extrapolated from animal experiments, is only eight times the recommended dose. These drugs may be bought across the counter by patients who tend to take more than the stated dose anyway, and some of whom are psychologically disturbed.

[This work will be published more fully in the *Journal of Pathology*.]

REFERENCE
Jones F A (1967) *Proc. roy. Soc. Med.* 60, 503

Effects of Chronic Purgative Abuse

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Purgatives are amongst the most widely used and abused of drugs. In considering some of the effects of chronic purgative ingestion, it is helpful to classify these drugs according to their mechanism of action, as follows:

Lubricants: Liquid paraffin, dioctyl sodium sulphosuccinate.

Bulk additives: Agar, methylcellulose.

Osmotic cathartics: (1) Unabsorbed salts; magnesium sulphate, sodium sulphate. (2) Other solutes, e.g. lactulose.

'Irritant' cathartics: Anthraquinones (rhubarb, senna, aloes, cascara). Phenolphthalein and derivatives, e.g. oxyphenisatin, bisacodyl (Dulcolax).