

Reporting simplified colonic transit studies using radionuclides: clinician friendly reports

A Notghi, A Mills, R Hutchinson, D Kumar, L K Harding

Abstract

This study describes a graphic presentation of the results of a simplified segmental colonic transit model. This study requires three sets of images on three consecutive days after intake of indium-111 resin capsule at each time point. The per cent of ingested activity is calculated in each region of the colon and in the faeces. The program uses standard PC compatible graphic package, CorelDRAW (Corel Corporation). The report for the patients' notes consists of three schematic diagrams of colon with regions identified and a pot representing the faecal activity. The per cent of administered activity in each region and pot is both printed and represented by shades of grey (white representing 0% and black 100% activity), for each region and the pot. The distribution of activity is clearly seen at each time point and the report is presented on single A4 size sheet of paper. Using a simplified colonic study protocol it is possible to produce clinician friendly reports on a single sheet of paper.

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Keywords: colonic transit, radionuclides.

Segmental colonic transit studies using radionuclides are prolonged, entailing intermittent imaging for a minimum of three days, and sometimes up to 10 days.¹⁻³ As the colon is divided into many regions, there may be many data points over such a period. For such studies we have developed a method of data presentation (condensed images) that permits the full data to be presented in a comprehensible format.^{4,5} This method of presentation includes all the data points and is comparatively easy to interpret. Interpretation and understanding of condensed images, however, requires some degree of familiarity and experience.

A simplified method can be developed which, although not suitable for detailed trials and physiological studies, contains the essential clinical information required for patient management. We have already described such a method entailing three sets of images³ and this permits most nuclear medicine departments to perform colonic transit studies as there is little demand on time and equipment.

As a further development we propose a clinician friendly format of presenting data that contains all the information of the simplified method and is easy to understand.

Methods

Indium-111 is absorbed on resin and then encapsulated in a pH sensitive capsule, which is designed to deliver the activity before it reaches the caecum. The first set of images is acquired eight hours after the ingestion of the capsule (end of first day). The second set of images is acquired during the course of the second day and the third set at the end of the third day.³ Each set of images includes an anterior abdominal and a posterior abdominal view. The colon, on both anterior and posterior views, is divided into as many regions as is required. In our experience four regions are sufficient and they are as follows: region 1 – ascending colon and hepatic flexure; region 2 – transverse colon; region 3 – splenic flexure; region 4 – descending colon, sigmoid, and rectum; region 5 – this region is not drawn or seen on the images. It is a calculated region that represents the faecal activity. This is calculated as the count loss from the abdomen.

Using the method of geometric mean of the anterior and posterior counts in each region⁶ the true count, independent of the depth of activity in the abdomen, can be calculated. The percentage of the administered activity in each region¹⁻⁵ for each time point (three time points) is then calculated.

A form is designed using a graphic package CorelDRAW (Corel Corporation) for personal computers. Three schematic colon diagrams are already drawn and divided into the four regions of interest with the activity in the faeces represented as a 'pot' (see Figure). The per cent of activity in each region is shown besides the region. Regions are coloured in a grey shade, which represents the percentage of activity in that region: white if there is no activity to black for 100% activity. The graphics package allows us to paint in the appropriate grey shade in the region of interest by typing in the percentage activity. With laser printers it is possible to have tens of grey shades to reflect the per cent activity accurately (Figure). The report is printed directly below the colonic diagrams.

Discussion

We have performed over 200 colonic transit studies using the described method. Although patients can often be clearly shown to have one of the known segmental colonic transit patterns, there are some in whom the whole data needs to be presented to the clinician for accurate diagnosis. Colonic data presented as curves, parametric images, or geometric centre can be difficult to interpret.⁴ With a clinician friendly report it is possible to convey sufficient

Department of Physics and Nuclear Medicine, Dudley Road Hospital, Birmingham

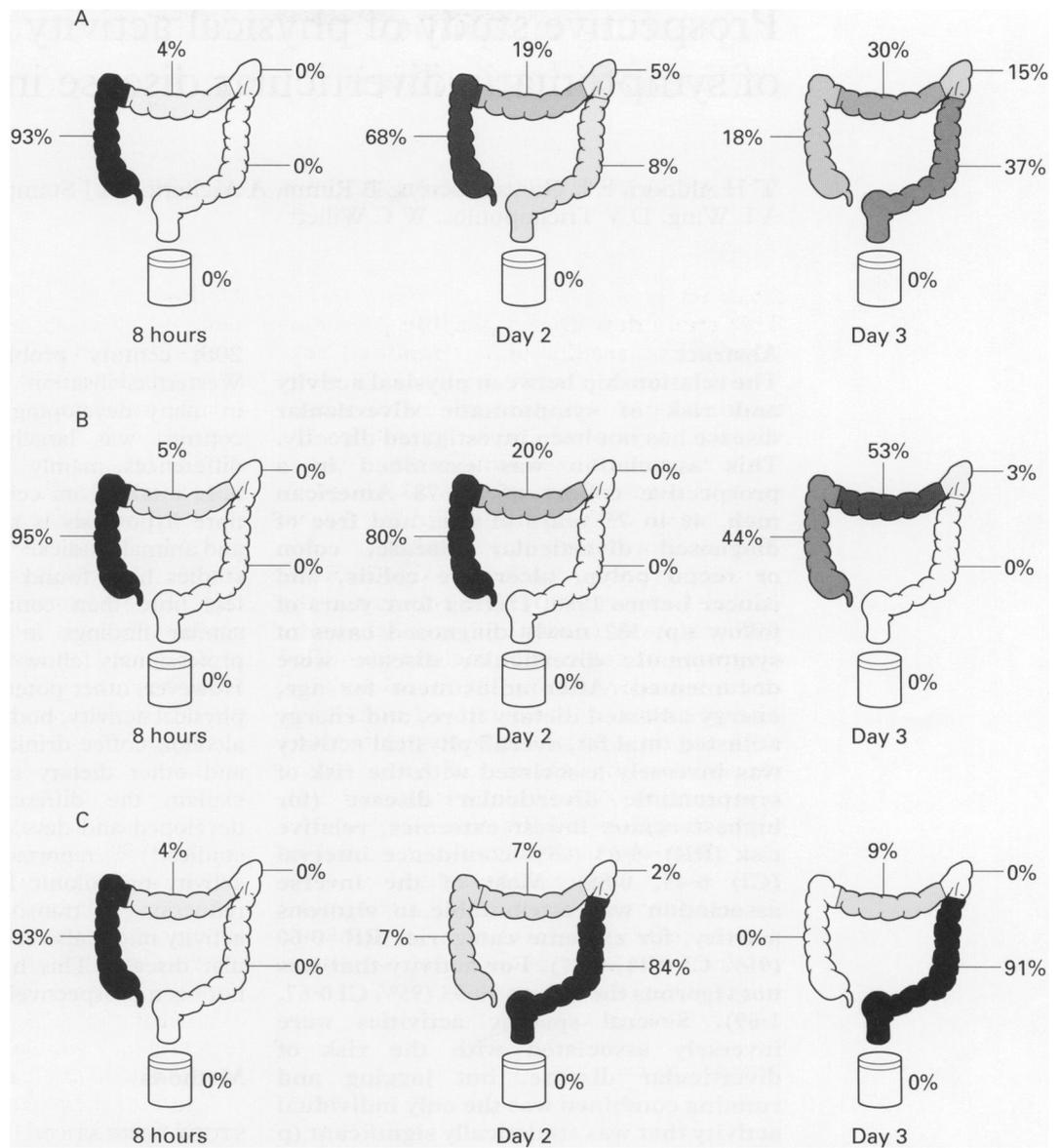
A Notghi
A Mills
L K Harding

Department of Surgery, Queen Elizabeth Hospital, Birmingham

R Hutchinson
D Kumar

Correspondence to:
Dr A Notghi, Department of Physics and Nuclear Medicine, Dudley Road Hospital, Birmingham B18 7QH.

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Examples of three patterns of colonic transit using 'clinician friendly reports': (A) generalised delay, (B) right sided delay, and (C) left sided delay.

data for clinical use in addition to the formal report. Even those new to the field can understand the report, which is both visual and quantitative. The figure shows three examples of colonic transit using this method of presentation.

In conclusion, with simplified methods it is possible to supplement formal report with schematic images of percentage of activity in colonic segments and in faeces. Unlike previously described methods,^{1 3 4} the diagrams are easy to understand and permit clinicians to visualise the information, which is particularly useful in patients with borderline colonic transit.

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