

## Modulation of oro-caecal transit time by hypnosis

L. Beaugerie, A J Burger, J F Cadranel, P Lamy, J P Gendre, Y Le Quintrec

### Abstract

The ability of hypnosis to modulate the oro-caecal transit time of 10 g lactulose was tested in six healthy volunteers. Oro-caecal transit time was measured by the hydrogen breath test during three periods in random order. During the control period the subjects remained throughout the test in a semirecumbent position without moving. During the hypnotic relaxation period subjects were hypnotised before lactulose ingestion and were instructed to experience relaxation till the oro-caecal transit time had elapsed. During the acceleration suggestion period subjects were hypnotised before lactulose ingestion and were repeatedly instructed to imagine the acceleration of lactulose through the intestine until transit time had elapsed. The mean oro-caecal transit time was significantly longer during the hypnotic relaxation period (mean (SEM) 133 (8) min) than during the control period (93 (13) min). The mean oro-caecal transit time during the acceleration suggestion period was 105 (26) minutes and was not significantly different from the mean transit time during the control period. The individual values during the acceleration suggestion period were scattered. We conclude that lactulose oro-caecal transit time is delayed during hypnotic relaxation.

Hypnosis induces a state of relaxation. The physiological changes of the relaxation response, including a simultaneous lowering of blood pressure and heart and respiratory rates, are opposite to those induced by stress.<sup>1</sup> Psychological stress has been shown to shorten the oro-caecal transit time of a standard meal in healthy volunteers.<sup>2</sup> The first aim of our study was to test the effect of hypnotically induced relaxation on the oro-caecal transit time of 10 g lactulose in healthy volunteers. Suggestibility is increased during hypnosis. The second aim of our study was to test the effect of the suggestion during hypnosis of transit acceleration on the oro-caecal transit time of 10 g lactulose.

### Subjects and methods

Six healthy volunteers (two men, four women), aged 21-32 years, participated in the study. They had no history of gastrointestinal disease or recent treatment with antibiotics and had never taken laxatives. Each subject gave written informed consent to the protocol, which was approved by the local ethics committee. Two of the volunteers had previously been hypnotised (subjects 2 and 4).

All subjects were studied for three periods (relaxation, acceleration, and control periods) in random order separated by at least one week. For all three test periods the subjects were instructed

to have a standard meal (rice, steak, and water ad libitum to minimise fasting hydrogen values) the evening before the test day and then to fast. All tests were performed in a quiet environment with the subjects at complete rest lying on a bed in a semirecumbent position. Oro-caecal time was measured as follows: at 9.30 am subjects were given 10 g of lactulose (Duphalac, Duphar, Villeurbanne, France) suspended in 100 ml of tap water. After lactulose ingestion end-expiratory breath samples were obtained every 10 minutes for three hours and collected into 50 ml plastic syringes through a modified Haldane-Priestley tube.<sup>3</sup> Samples were immediately analysed using an electrochemical cell (Exhaled Hydrogen Monitor, GMI Medical Ltd, Renfrew, Scotland). Oro-caecal transit time was defined as the interval between lactulose ingestion and the first and sustained rise of breath hydrogen - that is, an increase of at least 10 ppm above the baseline maintained or increased in the two following determinations.

During the relaxation period hypnosis was induced at 9 am by AJB using eye fixation, followed by standard deepening procedure till 9.15 am. The subjects ingested lactulose at 9.30 am. During this period they were repeatedly instructed to experience deep relaxation. A hypnotic state was maintained till the oro-caecal transit time elapsed (see above).

During the acceleration suggestion period hypnosis was induced at 9 am by AJB, followed by deepening procedure till 9.15 am and lactulose ingestion at 9.30 am. Immediately after ingestion the subjects were periodically instructed to visualise a cascade running fast, just as the liquid running in their intestine. Hypnosis was maintained till the oro-caecal transit time elapsed.

During the control period the subjects were

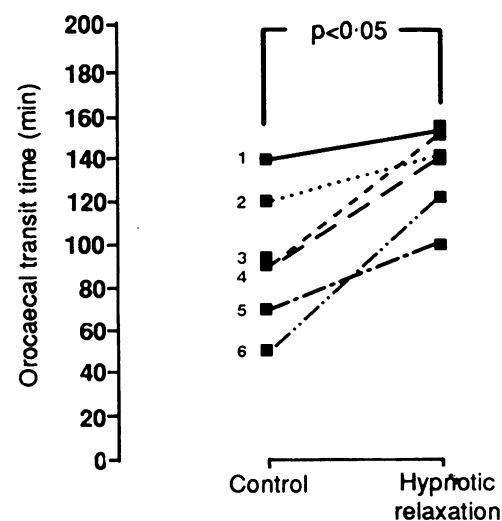


Figure 1: Orocaecal transit time of 10 g lactulose in six subjects during the control period (simple rest without moving) and hypnotic relaxation period.

Service d'Hépatogastroentérologie, Hôpital Rothschild, 33 boulevard de Picpus, 75571 Paris Cedex 12, France  
L. Beaugerie  
A J Burger  
J F Cadranel  
P Lamy  
J P Gendre  
Y Le Quintrec

Correspondence to:  
Dr L. Beaugerie.

Accepted for publication  
26 June 1990

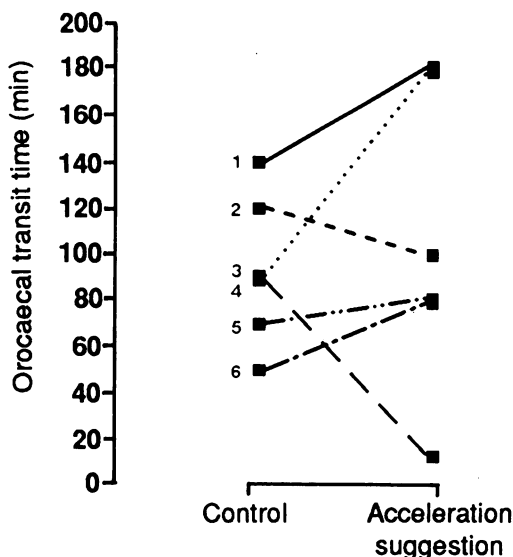


Figure 2: Orocaecal transit time of 10 g lactulose in six subjects during the acceleration suggestion period (repeated suggestion during hypnosis of accelerated transit).

instructed to keep quiet immediately after lactulose ingestion, and not to move or sleep, till the oro-caecal transit time elapsed.

Means were compared using the paired *t* test. Means and SEM are given.

### Results

The mean oro-caecal transit time was significantly longer during the relaxation period than during the control period (133 (8) min *v* 93 (13) min,  $p < 0.05$ , Fig 1). The mean oro-caecal transit time during the acceleration suggestion period was 105 (26) min, which was not significantly different from the mean transit time during the control period (Fig 2). The individual values during the acceleration suggestion period were scattered and were lower than in the control period for only the two subjects who had previously been hypnotised (subjects 2 and 4).

### Discussion

Hypnosis, like autogenic training, yoga, and meditation, induces a relaxation response gen-

erated by several physiological changes.<sup>1</sup> We have observed that the mean oro-caecal transit time in six volunteers was 133 minutes during hypnotically induced relaxation. This value was significantly higher than the mean value for the control period of 93 minutes. This latter value is closely similar to those reported under standard experimental conditions.<sup>4</sup> Thus our study shows that a delayed oro-caecal transit time for lactulose is part of the relaxation response. Since the physiological changes of the relaxation response are opposite to those induced by psychological stress our result is consistent with the shortening of transit time of a meal taken under psychological stress.<sup>2</sup>

Suggestibility is increased during the hypnotic state. The hypnotic suggestion of imagining a delicious meal induces a significant gastric secretion in healthy volunteers.<sup>5</sup> In our study the hypnotic suggestion of transit acceleration had various effects on the oro-caecal transit time. It must be emphasised that our subjects were not selected for having high levels of suggestibility as in the gastric secretion study.<sup>5</sup> Furthermore, since it is difficult to visualise mentally intestinal transit we were obliged to use the metaphor of the cascade. It is noteworthy that the only volunteer (subject 4) whose transit time was dramatically shortened during the acceleration period was a gastroenterologist who had been under hypnosis for a long time.

We conclude that the oro-caecal transit time for lactulose is clearly delayed during hypnotic relaxation. On the other hand, the effect of hypnotic suggestion of transit acceleration is variable among individuals, and could be partly related to different degrees of suggestibility and the ability to visualise. This latter hypothesis should be tested in further studies.

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## Modulation of oro-caecal transit time by hypnosis.

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*Gut* 1991 32: 393-394

doi: 10.1136/gut.32.4.393

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