Colonic transit time (CTT) in children and adolescents: Reference values

Colonic transit time values are not normally distributed. Therefore, percentile 95 is often used for upper reference values.

Two studies on totally 76 healthy subjects, 3-18 yrs, have been performed with the Abrahamsson Method (Transit-Pelletsmethod™) presenting percentile 95-values (Wagener et al 2004; Vande Velde et al 2013). In both studies the highest CTT value observed was 3.6 days (36 markers, 86.4 hours). In the Wagener study on 22 patients percentile 95 was 3.5 days and in the Vande Velde study on 54 patients the percentile 95 was 3.3 days.

Rintala et al (1997) studied 25 healthy children with the same method. The highest CTT value observed was 3.4 days while percentile 95 was not reported.

For calculation of segmental transit times with the Transit-Pelletsmethod™ four colonic sub-segments are usually considered as done in the Wagener and the Rintala studies (caecum-ascendens; transversum; descendens; recto-sigmoid).

Based on these reports on CTT a provisional upper reference value of about 3.3 days in children and adolescents seems reasonable until larger groups have been studied.

References


Colon transit time in healthy children and adolescents

S. Vande Velde • A. Notebaert • V. Meerschaut • N. Herregods • M. Van Winckel • S. Van Biervliet

Abstract

Purpose The aims of this study are to describe normal colon transit time (CTT) in healthy children, correlate results with age, the Bristol stool scale, and stool frequency, and to evaluate intra- and interobserver variability.

Methods Inclusion criteria were as follows: healthy children between 3 and 18 years old with a normal defecation pattern, no history of abdominal surgery, and no medication use. Total and segmental CTT is measured by taking ten polyethylene radiopaque markers during six consecutive days followed by a single abdominal X-ray on day 7. Total and segmental CTT are calculated by multiplying the number of markers by 2.4 (Abrahamsson et al. Scand J Gastroenterol 32:72–80, 1988).

Results Fifty-four children and adolescents have participated: 30 boys and 24 girls (median age 10 years (3–18 years)). Median total CTT is 36 h (2.4–86.4 h). There is no significant difference for age category (toddlers 31.2 h (2.4–74.4 h), elementary school 36 h (2.4–79.2 h), and adolescents 43.2 h (14.4–86.4 h)). Segmental CTT reveals a median right colon CTT of 4.8 h (0–28.8 h); a median left colon CTT of 2.4 h (0–31.2 h); and a median rectosigmoid CTT of 24 h (0–64.8 h). The Bristol stool scale correlates with total CTT (p=0.031). The intra- and interobserver variability displays an ICC of 0.999 for the total CTT.

Conclusion The CTT of normal healthy children is not sex- or age-related (above the age of 3 years). The Abrahamsson method for CTT measurement by using bony landmarks for the determination of colon segments is easy to perform and well tolerated with a virtual inexistent rating difference between different observers.

Keywords Colon transit time • Child • Young adult • Normal values