

## Research of application with pressure controllable simple enemator for colon diseases in the course of diagnoses and treatment

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### Abstract

**AIM:** On the basis of the principle of gas state change ( $P_1 \times V_1 / T_1 = P_2 \times V_2 / T_2$ ) and of communicating vessel. A pressure controllable simple enemator made by ourselves (PCSE) can be applied to contrast examination, to pressure determination and to reduction of intussusception.

**METHODS:** A PCSE was made up of a humidistat bottle, a bigeminy bulb, a manometer *etc.* 108 cases (age 16-72 years) with barium air double contrast radiography had been cleaned enema before examination. Some cases were examined after colonofiberscopy. Colon cavity would be perfused with thin colloidal suspension (100 mL-200 mL) and with compressed air (12.5 kPa, 3, 4 times). The pressure in colon cavity could be determined. The dilation change of colon could be observed and photographed. Some cases were injected 654.2 20 mg into the muscles respectively 5 min before examination. 26 cases (age 4 /12-6 years) of intussusception were reduced by simple compressed air, *etc.* If the pressure showed too high or the complaints were bitter, it was necessary to air to

decrease pressure.

**RESULTS:** The success ratio of contrast examination arrived at 99%. Small lesions such as polyps, cancer and so on could be showed and be correctly diagnosed (the positive accordion rate compared with colonoscopy was 94%). The scope and character of obstructive lesions could be determined more clearly. The buffer capacity of unobstructive colon cavity was large enough. Under  $3.9 \pm 0.8$  kPa MDP (Moderate degree pressure), dilatation diameter of colon cavity was  $5.8 \pm 1.4$  cm. Safety exam pressure (SEP) could be mainly determined by speed of pressure change and acuity of complaints. The abdominal symptoms such as pain and so on could be relieved with 654.2 injected, which could be helpful to accomplish examination; but it had little influence on pressure and calibre of examination. In contrast to incomplete obstructive lesions, the influence to pressure and calibre in complete obstructive lesion had significant difference ( $P < 0.01$ ). The success ratio of the reduction of intussusception was 92%. All RP (reposition pressure) among which 18 cases' were 9.3-12.0 kPa are 8.0-16.0 kPa. The pressure fluctuation (2.7-4.0 kPa) would be helpful for the intussusception to be reduced.

**CONCLUSION:** Being cheaply and manipulated easily, the PCSE can be applied accurately and safely to barium air double contrast examination and effectively to the treatment of reduction of intussusception with air enema. Colon moderate dilatation can be regulated easily, lesions can be clearly manifested. Near machine manipulation will be available for better co-operation between examiner and patient to smoothly complete examination and treatment. It will be spread and applied in different grade hospitals of different levels.

**Key words:** Intussusception/diagnosis; Intussusception/therapy; Barium/diagnosis use; Enema

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