O43 INTRA-ABDOMINAL PRESSURE VARIATIONS IN HUMANS DURING PHYSICAL EXERCISES AND DAILY LIFE BY INTRAGASTRIC WIRELESS SENSOR

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Aim: The conflict between the intra-abdominal pressure (IAP) applied to the abdominal wall and its resistance determines the occurrence of ventral hernia. Knowledge about IAP variation in everyday life is limited and mainly obtained by invasive methods. The objective of the study is to propose a comprehensive evaluation of IAP based on a limited risk and discomfort method.

Material and Methods: A prospective study was carried out in 20 healthy volunteers. The intragastric pressure, validated for estimating IAP, was assessed by an ingestible pressure sensor*. Volunteers realized a set of supervised exercises, including breathing, apnea after calm exhalation and seven muscle contraction stereotyped exercises in three different positions (supine, sitting, standing). Then the volunteers resumed their daily activities with the pressure continuously recorded until gastric emptying. Pressure variations and rates were computed.

Results: The highest IAP levels were reached during coughing and jumping. Maximum peaks were respectively 65 ± 35 and 67 ± 31 mmHg with pressure rates of 121 and 114 mmHg.s⁻¹ for these two exercises. The position did not affect the IAP variation. Men had significantly higher pressure values for pushing against a wall (P < 0.01), Valsalva maneuver and legs raising (P < 0.05) exercises. During daily life, peaks greater than 50, 100, and 150 mmHg occurred on average five times, twice, and once per hour, respectively.

Conclusions: This study provides a real-life characterization of IAP allowing the quantification of mechanical solicitation applied to the abdominal wall and the identification of risk situations for the occurrence of ventral hernias.

* (SmartPill™, Medtronic, Minneapolis, MN, U.S.A)