

Repeatability of intra-abdominal pressure measurement in pregnancy

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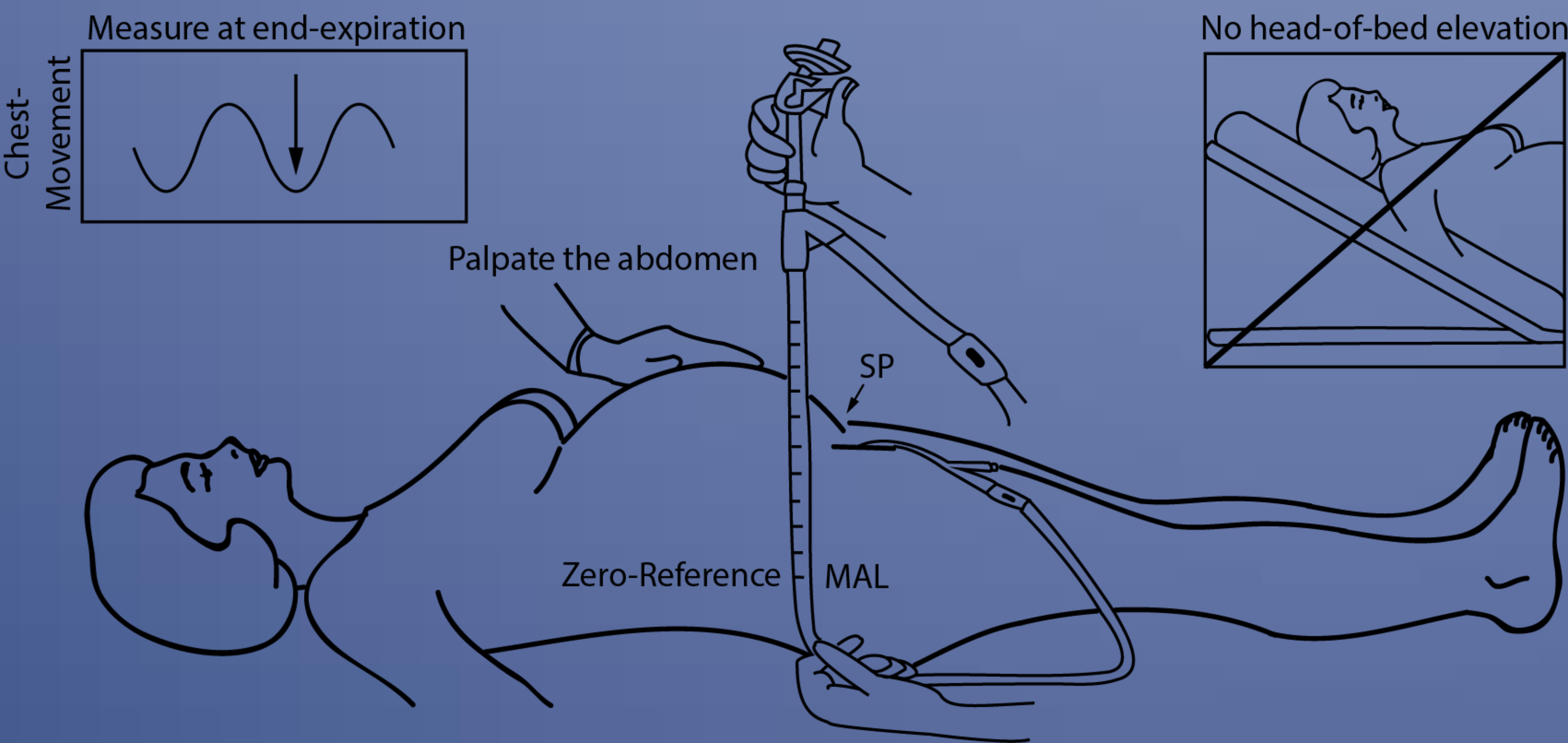
Background

It is well known that an elevated intra-abdominal pressure (IAP) can lead to harmful and even lethal conditions. IAP is thought to be an underestimated factor in a variety of pathophysiological processes outside critical care, like in complications of pregnancy. To assess the significance of IAP in some pregnancy-related diseases, a reliable and repeatable method needs to be established to measure IAP in the pregnant population. The FoleyManometer Low Volume (FMLV) (Holtech Medical, Charlottenlund, Denmark) is a safe, easy to use and cost-effective device to measure IAP via the urinary bladder.

Objective

The aim of this study is to evaluate the **repeatability of intra-abdominal pressure (IAP) measurements** in women undergoing a **caesarean section (CS)** using the FMLV.

Methods

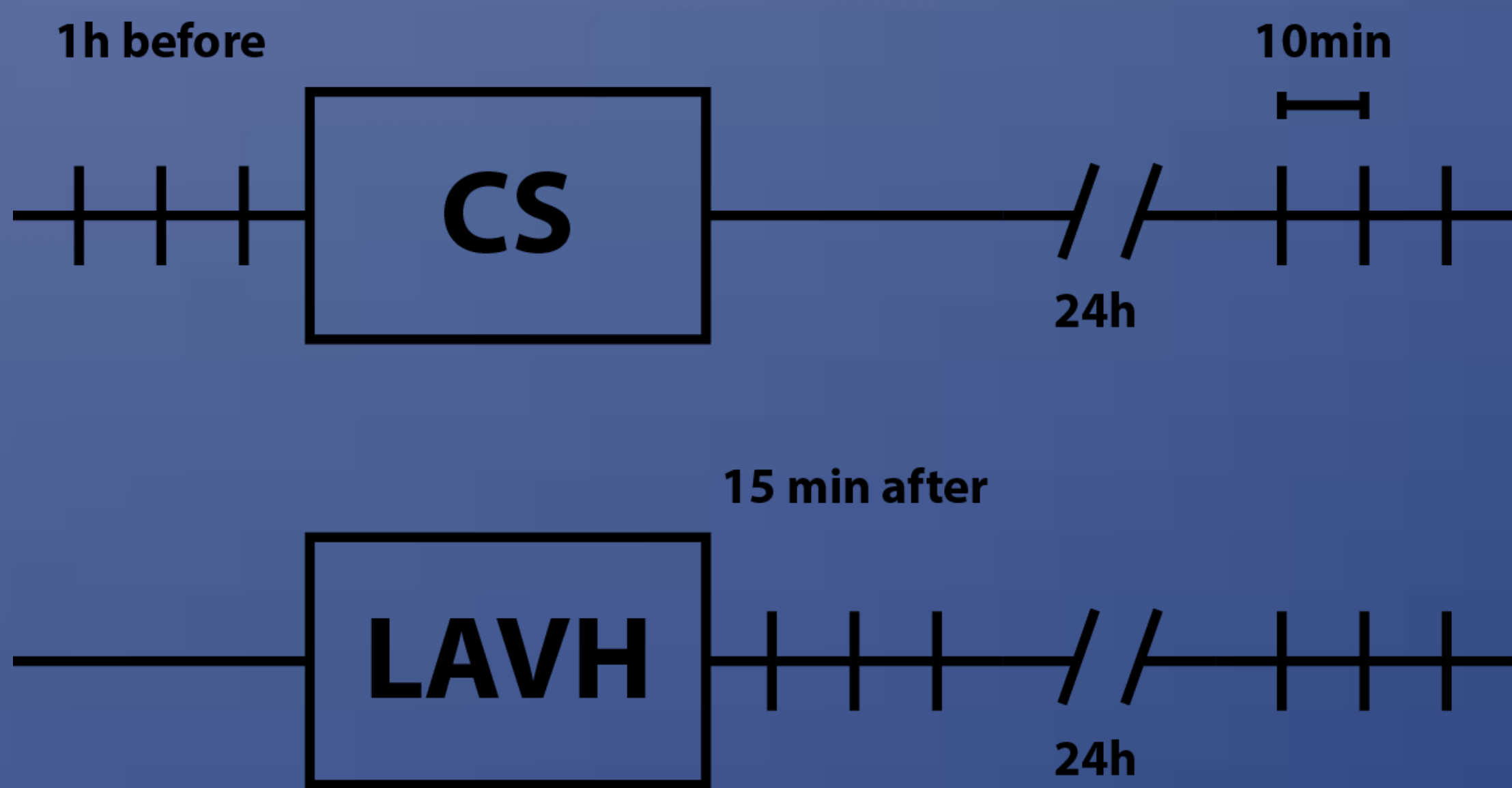


Series of **three consecutive measurements** with a time interval of 10 minutes were performed. In all **50 subjects, IAP_{MAL} was measured**. In a **subset** of subjects (n=14 and n=13 in the CS-group and the LAVH-group, respectively) both **IAP_{MAL} as well as IAP_{SP}** was evaluated.

Repeatability (or intra-observer reliability) was determined by calculating the **intra-class correlation coefficients (ICCs)** with 95% confidence interval (CI) between consecutive measurements using the SPSS 20.0 package (IBM Corp., Armonk, NY, USA).

50 subjects were included and categorized into two groups; 25 women undergoing a **caesarean section (CS-group)** and 25 women undergoing a **laparoscopic assisted vaginal hysterectomy (LAVH-group)** as a control group.

Two different zero-reference points were used; the **midaxillary line (MAL)** and the **symphysis pubis (SP)**.



Results

	Pre-CS		Post-CS		Post-LAVH		Day After LAVH	
	IAP _{MAL}	IAP _{SP}	IAP _{MAL}	IAP _{SP}	IAP _{MAL}	IAP _{SP}	IAP _{MAL}	IAP _{SP}
N	25	14	24	14	5	5	25	13
ICC	0,73	0,83	0,87	0,95	0,98	0,98	0,96	0,97
CI	0,55-0,86	0,64-0,94	0,76-0,94	0,86-0,98	0,92-1	0,88-1	0,93-0,98	0,93-0,99

In this repeated cross-sectional study, a total of **125 sets of 3 consecutive measurements** were executed.

Intra-observer correlation in the CS-group is lower than in the LAVH-group. ICC before CS is lower than after CS.

Discussion

IAP measurement in pregnant women using the FMLV is **highly repeatable**. Most ICC's are > 0.80, which indicates that **one single measurement is reliable**. Overall, ICCs in the CS-group is lower than in the LAVH-group, which might be explained by **difficulties in defining the specific zero-reference point in a pregnant women**. When compared to measurement before CS, repeatability after CS seems slightly higher, which might be due to **Braxton Hicks contractions**.

Measurements of IAP in pregnant women using the FMLV are highly reliable.