



Fayoum University  
of Medicine Faculty  
Anesthesia Department

جامعة الفيوم  
كلية الطب  
قسم التخدير

## البحث الثامن

### - عنوان البحث باللغة الانجليزية:

Effects of tidal volume challenge on the reliability of plethysmography variability index in hepatobiliary and pancreatic surgeries: a prospective interventional study.

### المشرفين علي البحث حسب الترتيب:

- آدم. جوزيف مكرم بطرس. د. ياسر سالم مصطفى. آدم. مجدي خليل. د. محمد فؤاد الجبار. أد. هاني محمود ياسين.

### - نوع البحث :

بحث مشترك منشور مشتق من رساله دكتوراه د. ياسر سالم مصطفى سبق تقييمه في لجنة ترقية أد. هاني محمود ياسين المنعقد في 17 نوفمبر عام 2032 الي درجة أستاذ وحصل علي تقدير مقبول 68.67% و عدد نقاط البحث 11.67.

### - مكان و تاريخ النشر:

- Journal of clinical monitoring and computing.
- Published in March 2023.
- ISSN: 1573-2614  
1387-1307

### ملخص البحث باللغة الانجليزية:

### Background:

The plethysmography variability index (PVI) is a non-invasive, real-time, and automated parameter for evaluating fluid responsiveness, but it does not reliably predict fluid responsiveness during low tidal volume (VT) ventilation. We hypothesized that in a 'tidal volume challenge' with a transient increase in tidal volume from 6 to 8 ml Kg<sup>-1</sup>, the changes in PVI could predict fluid responsiveness reliably.

**Method:**

We performed a prospective interventional study in adult patients undergoing hepatobiliary or pancreatic tumor resections and receiving controlled low VT ventilation. The values for PVI, perfusion index, stroke volume variation, and stroke volume index (SVI) were recorded at baseline VT of 6 ml Kg<sup>-1</sup>, 1 min after the VT challenge (8 ml Kg<sup>-1</sup>), 1 min after VT 6 ml Kg<sup>-1</sup> reduced back again, and then 5 min after crystalloid fluid bolus 6 ml kg<sup>-1</sup> (actual body weight) administered over 10 min. The fluid responders were identified by SVI rise  $\geq 10\%$  after the fluid bolus.

**Results:**

The area under the receiver operating characteristic curve for PVI value change ( $\Delta\text{PVI}_{6-8}$ ) after increasing VT from 6 to 8 ml Kg<sup>-1</sup> was 0.86 (95% confidence interval, 0.76–0.96),  $P < 0.001$ , 95% sensitivity, 68% specificity, and with best cut-off value of absolute change ( $\Delta\text{PVI}_{6-8}$ ) = 2.5%.

**Conclusion:**

In hepatobiliary and pancreatic surgeries, tidal volume challenge improves the reliability of PVI for predicting fluid responsiveness and changes in PVI values obtained after tidal volume challenge are comparable to the changes in SVI.