This paper, which has numerous paragraphs about various airway devices (used and not used in Scandinavia), does fortunately mention that basic airway management is important and occasionally challenging. However, we feel that a keynote paper like this should place even more emphasis on basic airway manoeuvres, and more focus on and description of the use of naso-pharyngeal and oro-pharyngeal adjuncts and proper descriptions of the two-hand technique as well as the two-person technique for Bag-Valve-Mask Ventilation. Also, we believe that a substantial set of guidelines should emphasise the importance of pre-oxygenation, of the proper positioning of the patient and the utilisation of the whole team as proposed in the recently published guidelines for pre-hospital anaesthesia from The Association of Anaesthetists of Great Britain and Ireland (http://www.aagbi.org/publications/guidelines/docs/prehospital_glossy09.pdf).

We wish the task force group the best of luck with work in the future.

P. P. Bredmose
J.-K. Heltne

Reference

1. Berlac P, Hyldmo PK, Kongstad P, Kurola J, Nakstad AR, Sandberg M. Scandinavian Society for Anesthesiology and Intensive Care Medicine. Pre-hospital airway management: guidelines from a task force from the Scandinavian Society for Anaesthesiology and Intensive Care Medicine. Acta Anaesthesiol Scand 2009; 53: 139–40.

Address:
Per P. Bredmose
Department of Anaesthesia and Intensive Care
Sykehuset Asker og Bærum
Norway
e-mail: bredmose@hotmail.com

The influence of pacing on the pre-ejection period

doi: 10.1111/j.1399-6576.2009.02063.x

Sir,

With interest we read the article from Vistisen et al.[1] about the ability of the pre-ejection period (PEP) variation indexed to tidal volume (PEPV) to predict fluid responsiveness following cardiac surgery even during ventilation using low tidals (around 6 ml/kg).

PEP is defined as the time interval between the onset of ventricular depolarization (the Q wave on the ECG) and the beginning of left ventricular ejection (systolic upstroke of the arterial blood pressure curve). PEP (and PEPV) depends on pre-load[2] but also, as Vistisen and colleagues mention, on afterload, contractility and vascular transit time.

Another variable that influences the PEP, and cannot be neglected in our opinion, is pacing of the heart. In the current study, most of the patients (18 out of 23) were paced during the measurements to obtain a heart rate of 80–90 beats/min. In our view it is important to know how the patients were paced; ventricular, atrial or atrioventricular. In case of ventricular pacing, which, in our centre is most common following cardiac surgery, temporary leads on the right ventricle result in a left bundle branch block configuration on the electrocardiogram as a consequence of a delayed activation (and thus contraction) of the left ventricle compared with the right ventricle. This leads to an uncoordinated contraction sequence and an abnormal movement of the interventricular septum. Since the contraction of the left ventricle (responsible for the systolic upstroke in the arterial blood pressure) is delayed, and the timing of dedepolarization of the right ventricle is normal, this will influence the PEP. Vistisen and colleagues used the R spike of the ECG (instead of the originally proposed Q spike[3]), but this will not change this effect because right ventricular pacing mainly influences the RS time instead of the QR time. Thus, when Vistisen and colleagues used ventricular pacing, it is likely that this influenced the results by lengthening the PEP. In contrast, when atrial pacing is used to manipulate the heart rate, PEP will not be influenced.

For a better understanding of the results, we would like to know how the patients were paced and whether or not the results of the ventricular paced patients differ from the patients who were atrially paced or not paced at all.

B. Lansdorp
J. M. D. van den Brule
J. G. van der Hoeven
P. Pickkers

References

1. Vistisen ST, Struijk JJ, Larsson A. Automated pre-ejection period variation indexed to tidal volume predicts fluid responsiveness after cardiac surgery. Acta Anaesthesiol Scand 2009; 53: 534–42.
2. Weissler AM. Current concepts in cardiology. Systolic-time intervals. N Engl J Med 1977; 296: 321–4.
3. Bendjelid K, Suter PM, Romand JA. The respiratory change in preejection period: a new method to predict fluid responsiveness. J Appl Physiol 2004; 96: 337–42.

Address:
Benno Lansdorp
Institute of Technical Medicine
University of Twente
PO Box 217
7500 AE Enschede
The Netherlands
e-mail: b.lansdorp@utwente.nl

Reply

doi: 10.1111/j.1399-6576.2009.02065.x

Sir,

We appreciate the comments by Dr Lansdorp and colleagues[1], who wish to know which types of pacing were used in our

recently published clinical investigation[2] and whether or not the pacing type influenced the results of our study that investigated the ability of a new version of the pre-ejection period (PEP) variation (PEPV) to predict fluid responsiveness.

In response to the questions raised, we provide additional data as shown in Figs 1 and 2. Eighteen of the 23 patients in our study were paced. Of these, 12 were atrial (A) paced and six were atrioventricular (AV) paced. None were ventricular paced. The mean PEP for each patient is plotted in Fig. 1 with respect to pacing type. In Fig. 2, we have repeated figure 2 from the original article (PEPV vs. change in cardiac index) and marked the AV-paced patients with squares and unpaced patients with circles.

Data were sparse and not normally distributed. Although surely underpowered, we performed a non-parametric analysis of variance (Kruskal–Wallis), and there was no statistically significant difference among the three groups, $P = 0.57$ (Fig. 1). Additionally, in our opinion, neither Fig. 1 nor Fig. 2 indicates any pacing-related tendencies that could limit the clinical value of PEPV. Similar figures for ΔPEP[3] revealed no pacing-related tendencies either. Note, however, that this analysis does not consider that some patients were responders to a volume expansion and some were not, i.e. that preload is not the same for each patient.

Although not indicated by the sparse data, the measured PEP may be affected by the AV pacing type analogous to the suggested effect of V pacing[1]. In this case, where the PEP may be prolonged because of the altered course of depolarization, the originally proposed PEP variation parameter (ΔPEP) would be affected because of ΔPEP's direct dependence on absolute PEP values (division by the mean PEP). However, PEPV would be much less affected by a prolonged PEP because this prolongation would be present (and essentially the same) for each heartbeat and thus be canceled in the calculation of PEPV.

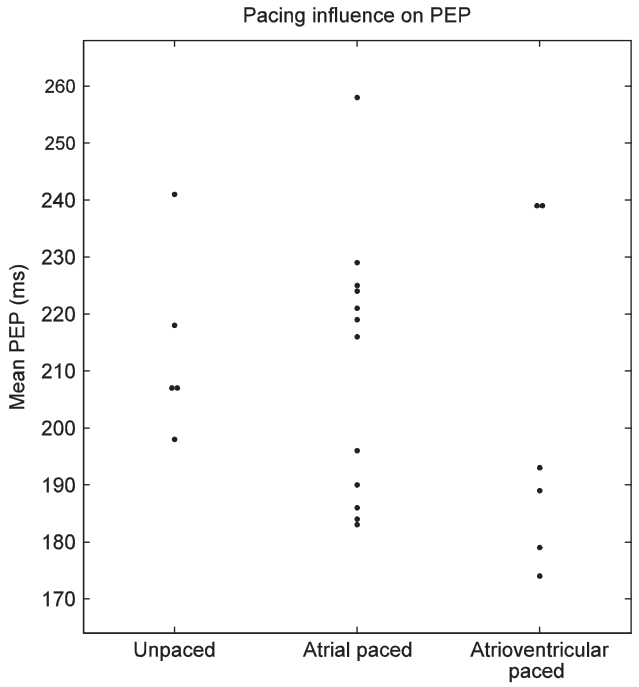

Fig. 1. Influence of pacing type on pre-ejection period (PEP).

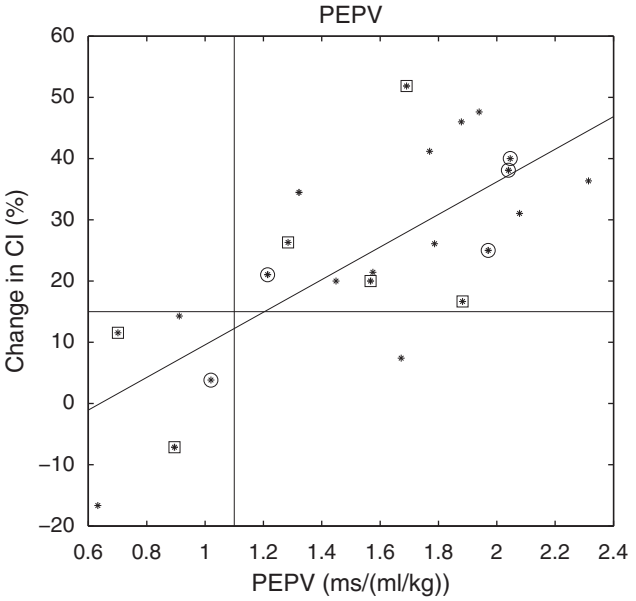

Fig. 2. Pre-ejection period variation (PEPV) vs. change in cardiac index (CI) plot. Unpaced patients are marked with circles, atrioventricular (AV)-paced patients are marked with squares, and atrial (A)-paced patients are left unmarked.

Acknowledgement

Conflicts of interest: The authors have no conflicts of interest to declare.

S. T. Vistisen
J. J. Struijk
A. Larsson

References

1. Lansdorp B, van den Brule JMD, van der Hoeven JG, Pickkers P. The influence of pacing on the pre-ejection period. Acta Anaesthesiol Scand 2010; 54: 123.
2. Vistisen ST, Struijk JJ, Larsson A. Automated pre-ejection period variation indexed to tidal volume predicts fluid responsiveness after cardiac surgery. Acta Anaesthesiol Scand 2009; 53: 534–42.
3. Bendjelid K, Suter PM, Romand JA. The respiratory change in preejection period: a new method to predict fluid responsiveness. J Appl Physiol 2004; 96: 337–42.

Address:
Simon Tilma Vistisen
Department of Anaesthesia and Intensive Care
Nørrebrogade 44, bygning 1C, 1. sal
8000 Århus C
Denmark
e-mail: vistisen@ki.au.dk