CORRESPONDENCE

To the Editor: Dr. Lichtwarck-Aschoff and Dr. Guttmann have pointed out in their correspondence that Figure 8 in our work (1) is the result of an error of calculation. They are right, so it is, and we regret this deeply.

The Guttmann algorithm (2) claims to calculate the tracheal pressure in pediatric tubes during controlled ventilation based on proximal pressure and flow combined with a number of constants entered into an equation based on a second order polynomial including an inertia factor. During our validation of the fiber-optic micro-pressure transducer, we had an excellent opportunity to test the validity of the Guttmann algorithm. However, in order to safeguard against any misrepresentation of the method, I mailed data and calculations to Dr. Guttmann on October 28, 2000, and a reminder on November 4, 2000. The paper was submitted during early spring 2001 and in revised form early July, unfortunately without an answer from Dr. Guttmann. With the assistance of Dr. Lichtwarck-Aschoff, the calculations have been remedied and the following emerges (Figs. 1 and 2):

Figure 1. Guttman algorithm for P_{trach} I. *Clean* ETT 4. Full line: P_{prox} measured by conventional pressure transducer; open diamonds: P_{trach} calculated a.m. Guttman (in Sondergaard-calculation, SS); filled diamonds: P_{trach} measured with fiber-optic pressure transducer. The Guttman algorithm works well during inspiration, but cannot reproduce the slowly decaying expiratory pressure. The oscillations at start of expiration may be ascribed to the functioning of the ventilator valves.

From these figures, I conclude:

1. The Guttman algorithm correctly calculates the inspiratory tracheal pressure based on proximal measurement of flow, pressure, and knowledge of tube size and length in *clean* tubes in a lung model.
2. The algorithm is unable to reproduce the exponential decay of tracheal pressure during expiration.
3. The algorithm is unable to calculate inspiratory and expiratory tracheal pressure in the presence of secretions in the tube.
4. I made a serious misrepresentation of the Guttman algorithm in (1).

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Figure 2. Guttman algorithm for P_{trach} II. ETT 4 with secretion amounting to 10% of tube volume. Legends identical to Figure 1, *open squares*: P_{trach} calculated a.m. Guttman (according to Lichtwarck-Aschoff, LA). The Guttman algorithm does not work in the presence of secretion. The minor differences between Dr. Lichtwarck-Aschoff's and my calculation are explained by the fact that Dr. Lichtwarck-Aschoff left out the inertia component of his calculation. Oscillations at start expiration are more pronounced owing to higher pressure and flow during VCV setting.

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