CORRESPONDENCE

COMPARISON OF PRESSURES MEASURED FROM THE PROXIMAL EXTERNAL JUGULAR VEIN AND FROM A CENTRAL VEIN

Sir,—The study by Shah, Swai and Latto (1986) comparing the venous pressures measured from the proximal external jugular vein and from a central vein was interesting. The authors found a mean difference in pressure of 3 mm Hg from the two sites which was not influenced by alterations in the head position or the side of jugular venous catheterization.

Whether the reference zero is the right atrium or manubriosternal joint, the manometer scale or transducer must bear a constant relationship to the zero (Lawler, 1980). The scale or transducer should be fixed to the patient or the operating table, rather than to a freestanding pole. The authors have failed to mention the position of the transducer in relation to the zero point. As the measurements were taken in the horizontal position, one is compelled to believe that the transducer was at the body level. Although a source of error did exist, it was probably equal for all the measurements. As long as the body position is horizontal, the measurement from a slightly distant vein like proximal external jugular may reflect near true venous pressures, as the authors have found. This is not necessarily true if the patient is tilted or slightly head-up on the operating table or intensive care bed. Then the position of the transducer becomes more important. Moreover, changes in the central venous pressure are more important than a single value, particularly after fluid challenge.

It remains to be seen what the effects of posture and fluid challenge would be on the pressures measured from the proximal external jugular vein and a central vein.

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REFERENCES


Sir,—We would like to thank Dr. Kumar for his interest in our study and for his comments related to it.

We used the manubriosternal joint as the reference zero, with the transducer fixed to a free standing pole. The patient was at the same horizontal level and the transducer had a constant relationship to the reference zero throughout the study period. As the title suggests, our study compared the pressures from the external jugular vein and from a reliably placed central venous line using this reference zero. We therefore fail to understand his contention that a source of error did exist in our measurements.

We are entirely in agreement with his observation that pressures from the external jugular vein will be influenced by patient position. If the patient is placed in the head-up or head-down position, an allowance will need to be made for the hydrostatic pressure difference between the reference zero and the tip of the catheter in the external jugular vein. Indeed, adjustments may be made to central venous pressure measurements with changes in the patient’s position if the reference zero is the manubriosternal joint.

Measurement of the external jugular venous pressures and central venous pressure in response to a fluid challenge or changes in blood volume were not formally investigated in our cardiac patients, for obvious clinical reasons. However, the measurements in our study correlated over a wide range of pressures. Also the pressures from the two catheters during the course of cardiac anaesthesia were similar when measured.

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IN VITRO DEGRADATION OF ATRACURIUM IN HUMAN PLASMA

Sir,—The experiments reported by Stiller, Cook and Chakravorti (1985) confirm our earliest conclusions (Coker et al., 1981; Stenlake et al., 1981) that the particular structural features of atracurium enable the mutual promotion of Hofmann elimination and enzymic ester hydrolysis, in which the ester carbonyl groups facilitate Hofmann degradation and the quaternary ammonium groups enhance ester hydrolysis.

Thus, we observed about 70% decrease in potency in cats given atracurium which had been incubated for 30 min at 37 °C in pH 7.4 buffer, compared with unincubated atracurium in water acidified to pH 3.0. This finding was supported by the, as then, unpublished work of Merrett, Thompson and Webb (1983) in which potency measurements in mice, following incubation of atracurium with appropriate buffers, showed that it undergoes a non-enzymic decomposition four times faster at pH 7.6 and 10 times faster at pH 8.0 than at pH 6.9.

Such sensitivity to decomposition at mildly alkaline pH is uncharacteristic of chemically-mediated ester hydrolysis, but typical of Hofmann elimination. Accordingly, as we commented at the time, the extensive breakdown of atracurium in buffer at pH 7.4 (70%, in 30 min) rightly contrasts sharply with that of suxamethonium, which is incapable of Hofmann elimination and only 6% hydrolysed in 1 h in buffer at that pH, and no more than 12% hydrolysed in the same time at pH 7.7 (Goedde, Held and Atland, 1968). For this reason, whilst none of these experiments or the other supporting experiments reported in the same paper and elsewhere (Hughes and Chapple, 1981) distinguish unequivocally between the two breakdown reactions, we hold firmly to the view that Hofmann elimination is the predominant factor in the underlying chemical breakdown of atracurium in vitro.

We also found that atracurium was less stable in human plasma than in buffer—an observation supported by the later