CARDIAC ARREST FOLLOWING CENTRAL VENOUS CANNULATION

This refers to the article 'Cardiac arrest following central venous catheterization' (MJAFI 1996; 52: 204-5).

I must compliment the authors for presenting such a rare complication of central venous catheterization.

In elderly patients vagal tone is high. So these patients are prone to develop sudden bradycardia due to any stimulus. In this case atropine would have been a better choice in premedication.

The patient developed irregular pulse followed by bradycardia as the catheter was being advanced. In this case stimulation of SA node by the catheter tip was probably a cause of sudden bradycardia. Also light-plane of GA could have contributed to bradyarrhythmia. In such a situation atropine is the drug of choice to be administered

intravenously and not adrenaline. Immediate atropine administration when patient developed bradycardia, would have probably prevented occurrence of asystole.

The patient was connected to ECG monitor but the authors have not mentioned the type of arrhythmia developed initially.

As the internal jugular vein was selected for cannulation, it should not have been introduced to its fullest length as the distance up to right atrium is short.

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Author's reply

I thank Lt Col PM Velankar for his compliments and the interest shown in the article. My comments are as follows:

Glycopyrrolate is able to prevent bradycardia as effectively as atropine. However it causes less tachycardia and does not produce central anticholinergic syndrome in elderly patients [1]. It is also known that chronotropic response of heart to atropine is significantly blunted in such cases. Even though glycopyrrolate was used in this case because of aforementioned advantages. Our approach is flexible since there is dearth of literature proclaiming efficacy of atropine over glycopyrrolate in this age group. Hence it would be improper to assume that atropine is a better drug. It may be pertinent to mention here that the practice of premeditation has undergone a sea change since olden days and vagolytic drugs have lost much of their appeal in contemporary anaesthesia.

The hypothesis that bradycardia was a result of stimulation of sinoatrial (SA) node by the tip of cannula, is difficult to believe for two reasons. Firstly, the cannula was not long enough to enter right atrium (RA) or to reach close to SA node (vide infra). Secondly, if it were so, it does not explain second episode of bradycardia despite precautionary withdrawal of the cannula. As mentioned in our article, atrial arrhythmias though uncommon, are usually seen with insertion of long pulmonary artery catheters. Light plane of anaesthesia would in all probability cause tachycardia [2].

Atropine is indeed the drug of choice for supra-ventricular bradyarrhythmias. However, the same is not true for asystolic cardiac arrest where adrenaline still remains the initial drug to be administered followed by atropine and cardiac pacing in extreme cases [3]. At present evidence pertaining to the role of atropine in asystolic arrest is tenuous and equivocal [4]. In our case, the patient developed cardiac arrest rapidly compelling us to institute basic life support, immediately followed by adrenaline. These measures are in complete accordance with the protocol laid down by American Heart Association and European Resuscitation Council [5].

There was bradycardia only and no other arrhythmias were observed. It is our practice to perform internal jugular vein (IJV) cannulation through high anterior approach i.e. the site of puncture is lateral to carotid pulsations at the level of caudal end of thyroid cartilage with the needle tip pointing to ipsilateral nipple. Calculation of optimal length of the catheter in the article is based on this approach. Since we used a 15 cm long cannula (more accurately 13.3 cm, excluding the hub) it is almost definite that the cannula did not enter right atrium. Hence author's reservation regarding complete insertion of the cannula seems justified. The distance up to right atrium is short only if low approach to cannulate IJV is chosen. However, this approach is no more popular because of high incidence of pneumothorax.

It is re-emphasized that the most plausible explanation for cardiac arrest appears to be excessive carotid activity