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Correspondence

α receptors and ventricular tachycardia after clonidine withdrawal

Sir,

We have reported on a patient in whom repetitive ventricular tachycardia was induced by clonidine withdrawal.[1] In this patient up regulation of myocardial α adrenoreceptors was implicated in the genesis of tachycardia because intravenous phentolamine completely suppressed the tachycardia. It has been suggested that stimulation of α receptors enhances the induction of triggered automaticity,[2 3] which is said to be a cause of repetitive ventricular tachycardia.[4] We have some additional comments to make on the mechanism inducing this tachycardia.

In our earlier case report we could not determine whether the α_1 or α_2 receptors were mainly responsible for the tachycardia.[1] α_1 receptors, which are present in the heart, are more likely to have been responsible for tachycardia in our patient. But in contrast to the dramatic effectiveness of phentolamine in our patient the effect of orally administered prazosin, a selective α_1 blocker, on tachycardia was limited despite its considerable hypotensive effect. The plasma concentration of prazosin may have been too low to suppress the development of tachycardia.

Alternatively, α_2 receptors may have been involved in the tachycardia. α_2 receptors have not yet been found in the human heart, but their presence in the sheep heart has been suggested by Mugeli *et al*, who showed that α_2 receptors participated in noradrenaline induced triggered automaticity.[3] Clonidine reduces sympathetic outflow from the brain, and such a reduction can produce up regulation of postsynaptic α_2 receptors.[5] Clonidine is a partial α_2 agonist but α_2 receptors are reported to be relatively resistant to desensitisation,[5] although the withdrawal of an extraordinary large dose of clonidine can induce down regulation of vascular α_2 receptors.[6] The behaviour of human cardiac postsynaptic α receptors after withdrawal of long term clonidine is not known. But the possibility that α_2 receptors participate in the genesis of the tachycardia that follows clonidine withdrawal cannot be ruled out. In our patient the short term effect of clonidine was not known, because the dose (0·225 mg per day), was too low to produce an acute reduction in blood pressure.

Thus both α_1 and α_2 receptors may be involved in the genesis of the ventricular tachycardia that follows clonidine withdrawal. Evaluation of the effectiveness of selective α_1 and α_2 and, if possible, β blocker and calcium antagonists on the arrhythmias may give more information on this condition.

In clonidine withdrawal syndrome it may be advisable to prescribe a full dose of clonidine or non-selective α blocker and gradually taper the dose.

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