
Antiarrhythmic Therapy: Quinidine Gluconate vs Procainamide

To the Editor:

In a recent paper, Myerburg et al. (Circulation 59: 855, 1979) reported a group of patients who survived a prehospital cardiac arrest and were treated with procainamide or quinidine gluconate. Their post-hospitalization condition was followed for 4–32 months, with monthly Holter monitor tapes and measurement of dose-adjusted plasma drug levels.

Eight of 16 patients had a later cardiac arrest; only two were resuscitated. These eight occasionally had unstable plasma levels of the drug, i.e., subtherapeutic levels, compared with only two among the eight patients who did not have another cardiac arrest. The other chief finding was a lack of correspondence between drug dose and frequency of ventricular ectopic depolarizations.

Although no comparison of procainamide and quinidine gluconate was presented in the paper, calculations I have made from the tabulated data presented in the article show that very significant differences did exist between the two drugs (table 1). Thus, four out of five patients (80%) on quinidine gluconate had stable plasma values, compared with only two out of 11 patients (18%) on procainamide, a statistically significant difference (Fisher exact test, p = 0.036). Plasma levels were subtherapeutic in three of 20 quinidine gluconate determinations (15%) and 23 of 43 procainamide determinations (53.5%) (p = 0.0035).

The number of ventricular ectopic depolarizations (VEDs) per hour recorded for the quinidine gluconate-treated patients were much lower than those for the procainamide group (Mann-Whitney, p < 0.0003), as were the median VEDs per hour, two (range 0–91 VEDs/hr) for quinidine gluconate and 25 VEDs/hr (range 0–2726 VEDs/hr) for procainamide (median test, p < 0.001). If 10 VEDs/hr is used as a cutoff, as suggested by the authors, then 17 of 20 measurements were < 10 VEDs/hr in the quinidine gluconate group (85%), compared to 13 out of 43 in the procainamide group (30.2%), a very highly significant difference (Fisher exact, p = 0.0005).

Recurrent cardiac arrest (RCA) occurred in seven of 11 procainamide-treated patients (63.6%) but in only one out of five quinidine gluconate-treated patients (20%). A Fisher exact test showed that the number of RCAs experienced by the quinidine gluconate group was lower than that of the procainamide group. Although the probability level (p = 0.141) is not usually considered significant, the difference should not be dismissed. First, only one case was possibly more extreme (quinidine gluconate, 0/5 RCAs and procainamide, 8/11 RCAs) and for this case, p = 0.037. When, as recommended by Siegel, the Tocher modification of the Fisher exact test was applied to this outcome, the difference became significant. Second, the single RCA in the quinidine gluconate group occurred in a 21-year-old patient with cardiomyopathy. The other 15 patients ranged in age from 48–74 years (mean 63 years). If this patient is considered sufficiently atypical to justify elimination from the study, then the quinidine gluconate group had fewer RCAs than the procainamide group (Fisher exact, p = 0.051).

Finally, the gravity of the condition, reflected by eight RCAs out of 16 patients (6 died, two resuscitated), may justify a less stringent rejection level than customarily used.

The small number of patients in this study, especially in the quinidine gluconate group, requires confirmation of the findings. However, if as this study shows, quinidine gluconate is markedly superior to procainamide in reducing the occurrence of ventricular ectopic depolarizations, in maintaining therapeutic plasma levels of antiarrhythmic drugs, and probably in reducing recurrent cardiac arrests, quinidine gluconate should be the drug of choice in this very serious condition.

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The authors reply:

To the Editor:

We have reviewed Dr. Kletzkin's comments regarding differences between quinidine gluconate and procainamide, which he derived from the data in our paper. In collating and analyzing our data, too bad had noticed that if we analyzed for differences between quinidine gluconate and procainamide, statistically significant differences could be derived.

We elected to omit conclusions comparing quinidine gluconate and procainamide primarily because the study was not designed to test for such differences. Whether a patient was treated with quinidine gluconate or procainamide was determined in the majority of patients by the physician caring for the patient initially, and in a few patients because of intolerance to either one or the other drug. There was no attempt to randomize the use of the two drugs, thus making any conclusions about differences uncertain. No attempt was made to compare the effect of the two drugs in the same patient either in suppressing ventricular ectopic activity or in

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**Table 1. Summary of Quinidine Gluconate vs Procainamide**

<table>
<thead>
<tr>
<th></th>
<th>Quinidine</th>
<th>Procainamide</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plasma levels</td>
<td>Therapeutic levels</td>
<td>85%</td>
<td>46%</td>
</tr>
<tr>
<td></td>
<td>Patients with stable blood levels</td>
<td>17/20</td>
<td>20/43</td>
</tr>
<tr>
<td></td>
<td>VEDs/hr Median</td>
<td>80%</td>
<td>18%</td>
</tr>
<tr>
<td></td>
<td>Range</td>
<td>4/5</td>
<td>2/11</td>
</tr>
<tr>
<td></td>
<td>VEDs/hr &lt; 10</td>
<td>2</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>Range</td>
<td>0–91</td>
<td>0–2726</td>
</tr>
<tr>
<td></td>
<td>VEDs/hr &gt; 10</td>
<td>85%</td>
<td>30%</td>
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<tr>
<td></td>
<td>Range</td>
<td>17/20</td>
<td>13/43</td>
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<tr>
<td></td>
<td>RCAs</td>
<td>20%</td>
<td>64%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1/5</td>
<td>7/11</td>
</tr>
</tbody>
</table>


Abbreviations: VED = ventricular ectopic depolarization; RCA = recurrent cardiac arrest.
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M Kletzkin

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