Our thanks to Mrs Baker for expert help in the preparation of the manuscript.


**Massage in preterm infants**

**EDITOR**—I am uncertain that the conclusions of Acolet et al are secure from their report on the massage of preterm infants.1

Any interventions in infants are liable to cause definite effects. These are most easily seen as physiological variation—for example in the heart rate, and such physiological changes will have a neuroendocrine basis. Handling and massage of babies causes an increase in the heart rate2 3 and in our experience also the blood pressure (see figure). These almost immediate responses, occurring within one minute, are most probably related to catecholamine surges. In the report by Acolet et al there was no significant change in the adrenaline or noradrenaline. This was to be expected from their study design with blood samples being taken 45 minutes before and one hour after the massage—the half life of circulating catecholamines is approximately 2 minutes. Thus even after such extremely stressful procedures as intubation, the catecholamine concentrations have fallen to baseline within 10 minutes.4 In contradistinction the half life of cortisol is approximately 60 minutes. The 45 minute premassage sample was stated to be carried out in 'stable babies'. We are not told that they had received no handling or stress in the one hour before this sample was taken—such handling before the study period could account for the initial high values.

I believe that short term experiments such as those described by Acolet et al may gradually build up our knowledge of the potentially beneficial or harmful effects of our interventions, but such experiments must be carefully designed. It may be more useful to look at neuroendocrine excretion patterns in the urine than the concentrations present at a single moment of time in the blood when the half lives of such neurochemicals are so short.

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**References**


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**Drs Modi and Glover:**

The primary purpose of our study was to examine more long term alterations in neuroendocrine status rather than immediate changes. Nevertheless the suggestion that it may be more useful to consider changes in urinary excretion patterns over the course of a procedure is reasonable. However, Professor McIntosh's assertion that, on the basis of the small change in heart rate shown in the single infant he describes, our study is likely to have missed a significant response, is not supported by our observations. We were able to measure urinary excretion of noradrenaline and lactate over the course of the massage in some of the babies described in our paper. We found no significant differences in urinary noradrenaline/creatinine ratio (n=9, median after-before difference 3-5, p=0-34), or lactate/creatinine ratio (n=9, median after-before difference -0.06, p=0.48) (table). Results are presented factored by urinary creatinine to allow for alterations in urinary flow rate.

**Median (range) or urinary noradrenaline/creatinine and lactate/creatinine before, during and after massage**

<table>
<thead>
<tr>
<th>Noradrenaline/creatinine</th>
<th>Lactate/creatinine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before</td>
<td>15-9 (1 23-20 2)</td>
</tr>
<tr>
<td>During</td>
<td>15-3 (5 6-19 3)</td>
</tr>
<tr>
<td>After</td>
<td>15-6 (0 02-9-5)</td>
</tr>
</tbody>
</table>

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**Drs Modi and Glover comment:**

Noradrenaline, ng/ml; lactate mmol/l; creatinine mmol/l.
Massage in preterm infants.

N McIntosh

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