GLUCOSE TOLERANCE AND THE TRANSCENDENTAL MEDITATION PROGRAMME (A PILOT STUDY)

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The Transcendental Meditation technique led to more efficient blood glucose homeostasis in a standard oral glucose tolerance test, after only two months of practice. This finding indicates potential benefit of Transcendental Meditation in the treatment and prevention of diabetes.—EDITORS

The following is the text of the original paper which was presented at the International Congress on Research on Higher States of Consciousness at the Faculty of Science, Mahidol University, Bangkok, Thailand, 4 – 6 December 1980.

An investigation was conducted into the effects of the Transcendental Meditation (TM) technique on glucose tolerance in normal subjects. Five healthy male subjects of average age 27 years were administered a standard 50 gram oral glucose tolerance test before and after two months of practice of the TM technique. Four of the subjects were instructed in the technique following the initial assessment, while the fifth subject had already been practising the technique for six months. Blood glucose was determined using the Ames Dextrostix/Eyetone system.

There was an overall improvement in glucose tolerance after two months of the TM technique with a significant reduction in blood glucose ($p < .05$, paired t-test) at 60 minutes.

One subject with a ‘suspect’ two-hour blood glucose at the initial assessment exhibited normal glucose tolerance after two months practice of the TM technique.

The findings reported here may be due to endocrine changes demonstrated to occur as a result of the practice of Transcendental Meditation, such as reduced cortisol levels. Taken together with previous findings of reductions in serum cholesterol, normalization of weight, and greater autonomic stability, these results suggest that Transcendental Meditation may be valuable in the management of diabetes mellitus.

INTRODUCTION

The endocrine effects of the Transcendental Meditation (TM) technique have been studied by Jevning et al. (1976) and Bevan et al. (1976). The findings include significant decreases of plasma cortisol in experienced TM meditators during and after the practice and a lowering of thyroxine (T4) immediately following the practice. Since both cortisol and thyroxine are well known to affect carbohydrate metabolism, a pilot study was done to determine the influence of the TM technique on glucose tolerance.
METHODS

SUBJECTS—These were ten healthy males who were employed in light industry. One subject had been practising the TM technique for six months. The remaining nine were non-meditators and of these, five were later conscripted into the army and lost from the study.

APPARATUS—Blood glucose was determined using the Ames Dextrostix/Eyetone system. This has been shown by Martin (1972) and Schersten et al. (1974) to be a precise and reliable alternative to conventional laboratory methods.

PROCEDURE—A two-hour Oral Glucose Tolerance Test (GTT) was administered at 9 A.M. to all subjects after a 20-minute rest period. Capillary blood samples were obtained by finger pricks at times t = 0 (fasting), 30, 60, 90, and 120 minutes after a 50 gm glucose load. The non-meditating subjects were subsequently instructed in the TM technique. Two months later the five remaining subjects were retested as before except that the fasting sample was obtained before and after 20 minutes of the TM technique (t = 0° and t = 0 respectively) (figure 1 to figure 5).

RESULTS

Essentially all subjects have normal glucose tolerance except for Subject 2 whose two-hour blood glucose value is 'suspect' (table 1) (also see below). In the same subject, two months after TM instruction the glucose tolerance curve (figure 2) was lower and the two-hour value within normal range. In Subject 4, the hyperglycemic values at 30 and 60 minutes were probably due to an excessively rapid absorption of glucose from the intestine. This same subject also showed normal values at 30 and 60 minutes two months after TM instruction.

Figures 1 to 5 show each subject’s glucose tolerance curve. The mean glucose tolerance curves of the group before and after the two months TM practice are shown in figure 6. There is an overall lowering of the glucose tolerance curve after two months of TM practice and the difference was significant at t = 60 minutes of the GTT (p<0.05, paired t-test).

DISCUSSION

Conclusions drawn from the pilot inquiry with so few subjects must necessarily be guarded. Notwithstanding this, the results suggest that the TM technique improves the glucose tolerance of subjects after a period as short as two months.

To confirm this a more extensive longitudinal study is being planned. Serial testing of the subjects before and after TM instruction would be important to ensure reproducibility of results. This is especially necessary if the subjects include hitherto unsuspected ‘prediabetics’ and ‘chemical’ diabetics as the borderline area between them and normal subjects is not sharp but is instead a dynamic and fluid one (Fajans & Conn, 1961).

<table>
<thead>
<tr>
<th>SUBJECT</th>
<th>AGE (YEARS)</th>
<th>SEX</th>
<th>TM INSTRUCTION</th>
<th>BLOOD GLUCOSE (mg/dl)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>t = 0°  t = 0 20 min later</td>
<td>30 min 60 min 90 min 120 min</td>
</tr>
<tr>
<td>1</td>
<td>19</td>
<td>M</td>
<td>Before 90</td>
<td>150 145 108 110</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>After 75</td>
<td>130 145 120 68</td>
</tr>
<tr>
<td>2</td>
<td>18</td>
<td>M</td>
<td>Before 85</td>
<td>178 145 150 125</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>After 71</td>
<td>110 99 108 86</td>
</tr>
<tr>
<td>3</td>
<td>39</td>
<td>M</td>
<td>Before 80</td>
<td>110 145 148 95</td>
</tr>
<tr>
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<td></td>
<td></td>
<td>After 82</td>
<td>105 118 110 86</td>
</tr>
<tr>
<td>4</td>
<td>30</td>
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<td>Before 88</td>
<td>200 210 155 50</td>
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<td></td>
<td></td>
<td>After 81</td>
<td>150 160 98 52</td>
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<td>5*</td>
<td>29</td>
<td>M</td>
<td>6 Months 75</td>
<td>161 140 118 102</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>8 Months 80</td>
<td>160 108 100 90</td>
</tr>
</tbody>
</table>

* Subject already practising TM for 6 months

TABLE 1

GTT RESULTS BEFORE AND AFTER 2 MONTHS OF THE TM TECHNIQUE
Before TM instruction:
- 50 g oral glucose tolerance test performed following a 20-minute rest period.

Two months after TM instruction:
- 50 g oral glucose tolerance test performed following a 20-minute meditation period.

*Subject already meditating for 6 months at initial assessment.
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The improvement in glucose tolerance in this study may be related to the findings by Jevning, Bevan and others (1976) of lowered cortisol and thyroxine following the practice of the TM technique. Cortisol increases protein catabolism with increased gluconeogenesis in the liver and it also decreases peripheral glucose utilization. Thyroxine is also diabetogenic in action principally by increasing absorption of glucose from the intestine and also to some degree by hepatic glycogen depletion (probably through liberation of epinephrine). Since the action of both of these hormones is in effect to produce hyperglycemia and their levels are lowered following TM, this may partly explain the lower glucose tolerance curves following the TM practice. In order to shed more light on the influence of the TM programme on carbohydrate metabolism, further studies of insulin, glucagon and other hormones having a regulatory role will be needed.

The findings reported here, taken together with other findings in meditators of normalization of weight (Weldon et al., 1976), reduction in serum cholesterol (Cooper, 1976) and greater autonomic stability (Orme-Johnson, 1973), have important applications in the management of diabetes mellitus. A controlled clinical trial to assess the value of the TM programme in the treatment of diabetes mellitus has recently been proposed to the Singapore Diabetic Society.

ACKNOWLEDGEMENTS

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REFERENCES


COOPER, M. 1976. The effect of the Transcendental Meditation programme on blood pressure and blood lipids. Unpublished study, University of Tel Aviv Medical School, Tel Aviv, Israel.


