Should Lactating Women Exercise?

The safety of recreational exercise for lactating mothers has been examined in a prospective, intervention study. Thirty-three women, who were 6–8 weeks postpartum and breast-feeding exclusively were randomly chosen to join either an exercise or a control group. The exercise group took part in a program of aerobic activities averaging 4.5 sessions per week. After 12 weeks, aerobic capacity was significantly higher in the women who had exercised than in the controls, but no differences in body weight, body fatness, energy expenditure, or resting metabolic rate (RMR) were noted. The exercise program had no effect on breast milk output or composition or infant weight gain. This demonstrates that recreational exercise sufficient to improve cardiovascular fitness without substantially altering energy balance does not adversely affect lactation performance.

For many new mothers, particularly in Western societies, breast-feeding is a novel and unfamiliar process beset with many anxieties. One common fear is that the quantity and quality of breast milk produced by the mother is insufficient to satisfy the needs of the baby.1 A recent survey conducted in Great Britain2 cited “insufficient milk” as the most frequent reason for a mother stopping breast-feeding before 4 months (Table 1). Mothers seek advice and reassurance not only about the best ways to manage breast-feeding, but also about the compatibility of their diet and lifestyle to good lactation performance.

After pregnancy, many women wish to take part in regular exercise to return to a more active way of life. The suitability of exercise for lactating mothers has been questioned, as there is some evidence that strenuous exercise may increase the lactic acid concentration of breast milk, affecting its palatability and intake by the infant.3 In nonlactating women, exercise elicits a prolactin response.4 As prolactin is intimately involved in milk production, there is concern that exercise undertaken by breast-feeding women may interfere with lactational performance. Cross-sectional studies, however, have not demonstrated a negative association between physical activity level and lactation performance5 so that the advisability of exercise for breast-feeding women remains in question.

Dewey et al.7 recently conducted a study of exercise and lactation in 38 women, recruited from an initial screen of 88 eligible mothers. The women selected had no chronic illness, did not smoke, planned to breast-feed exclusively for at least 20 weeks, and had not exercised more than twice a week in the preceding 3 months. The 38 women were randomly assigned to an exercise and a control group. Of these 38 women, 5 did not complete the

Table 1. Reasons for Stopping Breast-Feeding before 4 Months in Great Britain, 1990

<table>
<thead>
<tr>
<th>Baby’s Age When Breast-Feeding Ceased*</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insufficient milk</td>
<td>51</td>
<td>60</td>
<td>65</td>
<td>59</td>
<td>56</td>
</tr>
<tr>
<td>Painful breasts</td>
<td>30</td>
<td>14</td>
<td>8</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>Baby rejected</td>
<td>20</td>
<td>8</td>
<td>7</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>Did not like breast-feeding</td>
<td>10</td>
<td>3</td>
<td>—</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Mother ill</td>
<td>10</td>
<td>10</td>
<td>7</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>Breast-feeding too tiring</td>
<td>8</td>
<td>13</td>
<td>13</td>
<td>10</td>
<td>9</td>
</tr>
<tr>
<td>Baby ill</td>
<td>7</td>
<td>6</td>
<td>3</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Returning to work</td>
<td>1</td>
<td>2</td>
<td>7</td>
<td>14</td>
<td>23</td>
</tr>
<tr>
<td>Breast-fed long enough</td>
<td>1</td>
<td>1</td>
<td>3</td>
<td>5</td>
<td>9</td>
</tr>
<tr>
<td>Other reasons</td>
<td>13</td>
<td>14</td>
<td>10</td>
<td>14</td>
<td>14</td>
</tr>
</tbody>
</table>

Figures are percentage of mothers in each time period. Periods when breast feeding ceased: A = 1 week but <2 weeks; B = 2 weeks but <6 weeks; C = 6 weeks but <2 months; D = 2 months but <3 months; E = 3 months but <4 months. Columns do not total 100% as some mothers gave more than one answer. Data compiled from White et al.2

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Table 2. Effect of 12 Weeks of Exercise on the Aerobic Capacity, Energy Intake, Energy Expenditure, and Body Composition of Breast-Feeding Women

<table>
<thead>
<tr>
<th>Exercise Group</th>
<th>Sedentary Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before</td>
<td>After</td>
</tr>
<tr>
<td>Aerobic capacity*</td>
<td>27.0 (4.8)</td>
</tr>
<tr>
<td>Energy intake (kcal/day)</td>
<td>2551 (438)c</td>
</tr>
<tr>
<td>Energy expenditureb (kcal/day)</td>
<td>2030 (451)</td>
</tr>
<tr>
<td>Resting metabolic rate (kcal/day)</td>
<td>1344 (132)</td>
</tr>
<tr>
<td>Resting metabolic rate (kcal/kg fat-free mass/day)</td>
<td>29.5 (2.3)</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>67.3 (10.2)</td>
</tr>
<tr>
<td>Body fat (%)</td>
<td>31.5 (5.6)</td>
</tr>
<tr>
<td>Number</td>
<td>18</td>
</tr>
</tbody>
</table>

Values are mean (SD).
* Maximal oxygen consumption—mL/O2/Kg/day.
† Excluding breast milk energy output.
‡ Significant difference at timepoint between groups; significance of differences within groups over time are not shown.

The effects of the exercise program on the output and composition of breast milk, resting metabolic rate (RMR), energy expenditure, maximal oxygen consumption, body composition, dietary intake, and plasma prolactin concentration were assessed. Baseline measurements were made prior to the start of the postpartum intervention (6–8 weeks), at the midpoint (12–14 weeks), and at the end of the study (18–20 weeks). Well-established measurement techniques were used and included: milk volume by test-weighing of the infant over 3 days with correction for insensible water losses; milk collection by alternate complete expression of one breast over 24 hours with analysis for fat, lactose, nitrogen, nonprotein nitrogen, and energy; body composition by hydrostatic weighing; maximal oxygen consumption by exercise on a treadmill at graded levels of intensity; RMR by indirect calorimetry; energy expenditure by heart rate monitoring with calibration against oxygen consumption at graded levels of expenditure; basal prolactin levels at least 2 hours after a breast-feed with response to a feed followed for 2 hours after nursing.

Over the period of the study, the exercise program increased the aerobic capacity of the mothers by 25%, compared with a 5% increase in the controls (Table 2). However, this difference between the groups was not reflected in estimates of energy expenditure, RMR, body composition, or weight loss over time (Table 2). In addition, the difference in reported energy intakes at baseline remained unaltered during the study period. These results suggest that the mothers who exercised compensated for their increased energy expenditure by reducing other activities during the day.

Taking part in exercise sessions for 12 weeks was shown to have no effect on the breast milk intake of the infants (expressed either as kg/day or intake/kg infant weight), on the increase in milk output that occurred over time, or on the macro-nutrient content of breast milk (Table 3). Most importantly, the weight gain of the infants over the...
Table 3. Effect of 12 Weeks of Exercise on the Lactation Performance of Breast-Feeding Women

<table>
<thead>
<tr>
<th></th>
<th>Exercise Group</th>
<th></th>
<th>Sedentary Group</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Before</td>
<td>After</td>
<td>Before</td>
<td>After</td>
</tr>
<tr>
<td>Breast milk output (g/day)</td>
<td>755 (129)</td>
<td>841 (147)</td>
<td>838 (176)</td>
<td>884 (155)</td>
</tr>
<tr>
<td>Breast milk output (g/kg/day)</td>
<td>150 (16)</td>
<td>117 (17)</td>
<td>153 (24)</td>
<td>118 (19)</td>
</tr>
<tr>
<td>Breast milk energy content (kcal/g)</td>
<td>0.64 (0.06)</td>
<td>0.62 (0.07)</td>
<td>0.64 (0.05)</td>
<td>0.63 (0.07)</td>
</tr>
<tr>
<td>Breast milk energy output (kcal/day)</td>
<td>479 (79)</td>
<td>505 (85)</td>
<td>515 (105)</td>
<td>541 (101)</td>
</tr>
</tbody>
</table>

Values are mean (SD). There were no significant differences between exercising women and sedentary controls; significance of differences within groups over time are not shown.

12-week period was similar in both groups. In addition, there were no differences between the two groups in basal plasma prolactin concentration or in the prolactin response to a feed. However, the prolactin concentrations as a whole decreased between baseline and the end of the study.

This study has shown that moderate exercise, sufficient to improve cardiovascular fitness without marked changes in energy expenditure, dietary intake, and body weight or composition does not jeopardize lactation performance. This finding should reassure breast-feeding women that they can safely take part in recreational exercise without risk to the nutrition and health of their infant.

3. Wallace JP, Inbar G, Emshhausen K. Infant accep-