Kenyan team care at the Special Olympics – 1991

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The Kenyan team that competed at the International Summer Special Olympics comprised 38 athletes (both men and women) selected from all competitors at the national championships. The team was examined and a physiological fitness test carried out. The results enabled the organizers to arrange for treatment of prevailing illnesses, and the training programme was adjusted to the athletes’ level. This team was voted the best team of the month of July, having won 33 gold, three silver and two bronze medals. Sound medical care of athletes should be taken before and during competition. Such management should aim at minimizing injuries and enabling athletes to perform at their best.

Keywords: Mental handicap, Special Olympic Games, medical examination, physiological test, injury

Medical management of competitive athletes is necessitated by the fact that sports and injuries go more or less together. In fact, modern competitive sport puts so much pressure on athletes that injuries are inevitable and the susceptibility of athletes to infections due to training-induced immunosuppression is greatly increased. Some of the factors that predispose an athlete to injuries include: inadequate training; overtraining; ill-fitting equipment; a high level of anxiety. A review of the literature reveals that sportsmen and women are highly susceptible to injuries during the training/competition period due to training-induced pathophysiological changes within the body. Chronic diseases such as epilepsy and asthma among athletes also necessitate medical attention before and during competitions. The Kenyan team competing at the International Summer Special Olympic Games (ISSOG) comprised mentally handicapped children. In this paper, the medical examination, physiological test and the injuries and illnesses encountered during the training of the team will be discussed.

Subjects and methods
The Kenyan team to the International Summer Special Olympic Games (ISSOG) comprised a total of 38 participants in athletics, soccer, swimming and volleyball, of whom 36 were mentally handicapped. (Two had the hyperkinetic syndrome and two were epileptic, in addition to the mental handicap.) All came from special schools or institutions attached to such schools. Their age, weight and height are indicated in Table 1.

Participants were selected during the national championships at which all provinces were represented. None of those selected had Down’s syndrome. Neither active nor treated congenital heart lesions were detected.

The team assembled for residential training 10 days before their departure. Before starting training, all the team underwent both a medical examination and a physiological fitness test. The purpose of the medical examination was to diagnose and treat existing illnesses/diseases and/or recommend more specialized treatment. All were subjected to the standard medical examination (Hutchinson’s Clinical Methods). Verification of gender, required in other competitions, was not necessary for the ISSOG.

The physiological exercise stress aimed to: establish the level of fitness of each athlete and obtain a group ranking according to the form of sport; identify extremely unfit individuals so as to integrate them carefully in training; diagnose cardiorespiratory anomalies during and immediately after exercise; obtain baseline anthropological and physiological data for future reference.

The exercise test was carried out using the Fitrim 300 stepper, an exercise machine with adjustable load and a computer registering time and step count simultaneously. The parameters measured were: resting blood pressure (RBP) (mmHg); resting heart rate (HR) (beats min⁻¹); heart rate at the end of the exercise stress; sum of the recovery heart rate up to 10 min; step count. Each subject was also monitored by auscultation for heart murmurs or breathing anomalies.

The training programme for all participants comprised an early morning run combined with gymnastic exercises lasting about 1 h, and a 2-h training session in the morning and in the afternoon. A training session started with a thorough warm-up followed by technique training and was concluded by cool-down exercises.

Results

Medical examination
Most subjects were in good physical and nutritional condition. None had cardiorespiratory disorders. The following findings were noted: scabies (one subject); a fungal skin infection (one subject); speech problems (motor aphasia: seven subjects); light hemiparesis...
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Table 1. Age, weight, height and step count of 38 Kenyan athletes

<table>
<thead>
<tr>
<th>Sport (n)</th>
<th>Age (years)</th>
<th>Weight (kg)</th>
<th>Height (cm)</th>
<th>Step count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soccer (14)</td>
<td>18.29(3.43)</td>
<td>53.36(8.03)</td>
<td>146.64(9.31)</td>
<td>626.43(128.23)</td>
</tr>
<tr>
<td>(13-25)</td>
<td>(39.0–64.5)</td>
<td>(145.0–180.0)</td>
<td>(266.0–790.0)</td>
<td></td>
</tr>
<tr>
<td>Swimming (2)</td>
<td>15.00(2.83)</td>
<td>48.35(5.44)</td>
<td>165.00(8.49)</td>
<td>662.50(47.38)</td>
</tr>
<tr>
<td>(13, 17)</td>
<td>(44.5, 52.0)</td>
<td>(159.0, 176.0)</td>
<td>(629.0, 696.0)</td>
<td></td>
</tr>
<tr>
<td>Athletics (10)</td>
<td>18.70(4.94)</td>
<td>53.45(7.00)</td>
<td>166.30(6.88)</td>
<td>646.30(74.00)</td>
</tr>
<tr>
<td>(14–28)</td>
<td>(40.0–63.0)</td>
<td>(159.0–176.0)</td>
<td>(580.0–729.0)</td>
<td></td>
</tr>
<tr>
<td>Volleyball (12)</td>
<td>16.58(2.88)</td>
<td>56.73(7.62)</td>
<td>158.50(7.18)</td>
<td>511.58(45.09)</td>
</tr>
<tr>
<td>(13–21)</td>
<td>(41.0–70.0)</td>
<td>(146.0–174.0)</td>
<td>(465.0–677.0)</td>
<td></td>
</tr>
<tr>
<td>Overall</td>
<td>17.68(3.74)</td>
<td>54.20(7.55)</td>
<td>163.16(8.37)</td>
<td>597.29(109.59)</td>
</tr>
<tr>
<td>(13–28)</td>
<td>(39.0–70.0)</td>
<td>(145.0–180.0)</td>
<td>(266.0–790.0)</td>
<td></td>
</tr>
</tbody>
</table>

Values are mean(s.d.)(range)

(two subjects); ongoing epilepsy treatment (two subjects); malaria treatment (one subject); another subject had a deep wound on his right index finger caused by a sharp object about 5 weeks before this examination.

Exercise stress test

Table 1 shows the mean values for age, weight, height and step count. There were no significant inter-group differences in the anthropological data – however, the volleyball team recorded the lowest step count.

The heart rate before and after the exercise test, as well as the recovery heart rates for athletics, soccer, swimming and volleyball are shown in Figures 1–4. Only four subjects attained heart rates over 180 beats min⁻¹, indicating the aerobic nature of the test. A comparison of the various teams (Figure 5) reveals that volleyballers had the lowest heart rate, followed by the athletes, soccer players and, finally, swimmers. There was a significant difference (P < 0.001; Student’s t test) in the step count between the athletes and volleyballers, and soccer and volleyball. However, the values for athletics and soccer did not differ significantly from one another (P > 0.05).

Linear regression analysis showed no relationship between recovery heart rate and step count or heart rate at the end of exercise and step count. The height of the subjects did not influence step count. There was a weak positive correlation between age and step count among the volleyballers (r = 0.64) and soccer players (r = 0.630), and a strong positive correlation between weight and step count among the soccer players (r = 0.701). The sum of the recovery heart rate versus the end heart rate correlated strongly in athletics (r = 0.779) and fairly strongly in soccer (r = 0.687), but no such relationship was established for volleyball (r = 0.121).

The light hemiparesis did not affect the step test, as the step count of those affected lay within the range of the mean and one standard deviation.

![Figure 1. Kenya Special Olympics Association (KSOA) volleyball players' heart rate response to the 12-min step test](http://bjsm.bmj.com/)

![Figure 2. Heart rate response to the 12-min step test for two swimmers](http://bjsm.bmj.com/)
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Statistics of illnesses and/or injuries during the training and competition period

The illnesses occurring during training and competition are summarized in Table 2. The most common complaints were athletes' foot (71%), headache (28.9%), throat infection and rashes (23.7% each).

The injuries incurred are reflected in Table 3. The most common complaint was muscle soreness (100%), followed by blunt injuries to the knee joint (52.6%). Trauma-induced inflammation of the knee joint formed the second most common injury in both athletics (60%) and soccer (78.6%); in volleyball, the second most common complaint was injuries to the fingers (50% of players).

Discussion

Medical examination

All the subjects were medically fit for training and competition. A few required minor treatment, but none of the complaints contraindicated participation.
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Table 3. Injuries treated during residential training and competition

<table>
<thead>
<tr>
<th>Injury</th>
<th>Athletics</th>
<th>Soccer</th>
<th>Swimming</th>
<th>Volleyball</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMCS</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>Thrower’s arm</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Abrasions</td>
<td>1</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>Laceration</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Muscle soreness</td>
<td>10</td>
<td>14</td>
<td>2</td>
<td>12</td>
<td>38</td>
</tr>
<tr>
<td>Contusions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shoulder joint</td>
<td>5</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>8</td>
</tr>
<tr>
<td>Elbow joint</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>Wrist joint</td>
<td>1</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>Fingers</td>
<td>-</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>7</td>
</tr>
<tr>
<td>Thigh</td>
<td>5</td>
<td>3</td>
<td>1</td>
<td>5</td>
<td>14</td>
</tr>
<tr>
<td>Knee joint</td>
<td>6</td>
<td>11</td>
<td>-</td>
<td>3</td>
<td>20</td>
</tr>
<tr>
<td>Ankle joint</td>
<td>4</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Total</td>
<td>37</td>
<td>34</td>
<td>6</td>
<td>33</td>
<td>110</td>
</tr>
</tbody>
</table>

AMCS, anterior muscle compartment syndrome

in sports. All epileptic attacks that occurred did so several hours after exercise, but those affected experienced only one attack each during the whole training and competition period. These attacks appeared unrelated to exercise and did not affect further participation or training.

Exercise stress test

The 12-min run test is an aerobic test that has proved valid and reliable in the diagnosis of fitness\(^{11,12}\) and its use in special populations is well documented\(^{13,14}\). We chose this test because it is less strenuous (and therefore less risky) than running\(^{15,16}\) and the coordination required is less than in cycling\(^{17}\). The relatively lower heart rates of volleyball players (Figure 5) may be due mainly to the fact that they exerted themselves less than the rest of the groups.

If we had adopted the criteria of Maksud and Coutts\(^{18}\), all our subjects would have been considered unfit. This fact was further supported by the pattern of the recovery of heart rate. From these results, it appeared as if most of the subjects had not trained for about 3 months (i.e. since the last
championships at which they were selected). These results therefore formed a basis for determining the intensity of the coaching programme in order to: minimize injuries; reduce the risk of overtraining with its attendant dangers; achieve peak form at the time of competition.

Illnesses and injuries during the residential training and competition

Muscle soreness, affecting all subjects, should be interpreted as the initial reaction of the body to exercise and it faded after 3 days. Injuries were promptly treated to enable the subjects to participate in both training and competition.

The Kenyan team to the ISSOG games won 33 gold medals, three silver and two bronze, so the number of medals won was the same as the number of team participants (38). Although Kenya is renowned for its sporting prowess, never before had any Kenyan team achieved such success. This success can be attributed to the scientific approach adopted in the preparation of the team, among other factors.

From a medical point of view, it is important to diagnose and manage illnesses and injuries early in order to ensure optimal participation in training and competition.

Acknowledgements

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References


See also

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