ORIGINAL RESEARCH PAPER

STUDY OF LEAN BODY MASS AND FAT MASS IN LONG DISTANCE RUNNERS.

KEY WORDS: long distance runners, skin fold thickness.

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Introduction

In the endeavour to achieve excellence in sport, all of the possible concomitants of performance have been subject to scientific research. Modern sport science is characterized by the purposefulness of its endeavor to improve elite athletes and to discover talents as precisely as possible. There is evidence to support the concept that an individual's physique greatly limits or enhances successful participation in physical activity. Elite and world class athletes have different physique than individuals in the nonathletic population.

Objectives

- To assess the lean body mass and fat mass of university and state level long distance runners.
- To assess the lean body mass and fat mass of age matched controls.
- To compare these parameters in study group and control.

Inclusion criteria

Regularly practicing daily for 2-3 hrs for 6 days a week. Playing at university or state level.

Exclusion criteria

Having any major illness. Those who are doing other type of exercises.

Material and methods

The present study was carried out in thirty male long distance runners playing at university and state level, their age range from 16-20 yrs with an average age of 17.2 yrs. Thirty age matched subjects taken as control group. Skinfold thickness was assessed at standard sites by using skin fold caliper. Percentage of body fat was measured using Fat-o-meter.

Results:

Body fat percentage and fat mass was lower in athletes than controls which was highly significant. Whereas lean body mass was also significantly lower in athletes than controls.

Conclusion:

Body fat percentage of athletes was less as compared to the controls, which may be due to the training regimens through which the athletes are undergoing. Lean body mass was significantly less in athletes as their weight was very much less than controls.

ABSTRACT

Background: In the endeavor to achieve excellence in sport, all of the possible concomitants of performance have been subject to scientific research. Modern sport science is characterized by the purposefulness of its endeavor to improve elite athletes and to discover talents as precisely as possible. There is evidence to support the concept that an individual’s physique greatly limits or enhances successful participation in physical activity. Elite and world class athletes have different physique than individuals in the nonathletic population.

Objectives: To assess and compare skinfold thickness of university and state level players and age matched controls.

Material and methods: The present study was carried out in thirty male long distance runners playing at university and state level, their age range from 16-20 yrs with an average of 17.2 yrs. Thirty age matched subjects taken as control group. Skinfold thickness was assessed at standard sites by using skin fold caliper. Percentage of body fat was measured using Fat-o-meter.

Results: Body fat percentage and fat mass was lower in athletes than controls which was highly significant. Whereas lean body mass was also significantly lower in athletes than controls.

Conclusion: Body fat percentage of athletes was less as compared to the controls, which may be due to the training regimens through which the athletes are undergoing. Lean body mass was significantly less in athletes as their weight was very much less than controls.

1) Bicep: On the arm midway between tip of acromion and the cubital fossa.

2) Tricep: On the back of arm midway between Acromion process and olecranon process.

3) Subscapular: Below the inferior border of scapula. Skinfold parallel to the border.

4) Suprailiac: Just above the iliac creast and parallel to the bone below.
The sum skin fold thickness of all the four sites was done and then body fat percentage was determined with fat-o-measure kit.

Fat Mass (kgs) = Total body weight X (%body fat /100).
Lean body mass(kgs) = total body weight - fat mass.

Observation and results
Data was analyzed by Unpaired t test

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Athletes Mean ± SD</th>
<th>Controls Mean ± SD</th>
<th>P value</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent Body Fat</td>
<td>0.08± 3.09</td>
<td>17.30 ± 4.16</td>
<td>&lt;0.001</td>
<td>HS</td>
</tr>
<tr>
<td>Fat mass (kg)</td>
<td>4.60±1.84</td>
<td>10.68±4.007</td>
<td>&lt;0.001</td>
<td>HS</td>
</tr>
<tr>
<td>LBM (Kg)</td>
<td>45.68 ± 2.95</td>
<td>49.38±6.24</td>
<td>&lt;0.05</td>
<td>Significant</td>
</tr>
</tbody>
</table>

Body composition:

Discussion
The body composition is assessed by percentage body fat (PBF), Fat mass (FM) and lean body mass or fat free mass (FFM)

In present study we recorded highly significant lower values of body fat percentage in athletes (9.08%) as compared to controls (17.30%) and highly significant lower values of fat mass recorded in athletes (4.60 kgs) than controls (10.68 kgs). Lean body mass in athletes was significantly lower (45.68 kgs) than in controls (49.38 kgs).

H.S Sodhi and L.S Sidhu observed more or less similar values of average body fat percent in an Indian athlete (9%).

About lean body mass similar observations made by Dr. Vandana Daulatabad etal, they observed significant lower values of lean body mass in athletes (47.9 kgs) than controls(53.1 kgs).

In comparative study of three group of runners by P. Bale et al, they recorded lower values of lean body mass in elite group than in good and average group of athletes.

It is expected that in athletes the lean body mass should be more than nonathletes, But in present study and in abovementioned studies, values of lean body mass in athletes were less than controls.

In the present study total body weight of athlete (50.29 ± 3.44 kgs) is highly significantly less than control group (60.06 ± 9.60 kgs). This may be the reason for proportionately lower values of lean body mass was recorded in athletes than in control.

In runners as in present study, as lower body segment muscle size increases more than upper body Total lean body mass of both the segments may not increase much. as in runners lower segment muscles are exposed to endurance activities.

Also with continuous endurance exercise skeletal muscle size can be increased by 30-60% (Guyton 10 edition)

These may be reasons for significantly less values of lean body mass recorded in athletes in present study.

Conclusion
1) Body fat percentage of our athletes is less as compared to controls which may be due to the training regimens through which athletes are undergoing.
2) Lean body mass was significantly less in athletes as their weight was much less than controls.
3) from this we can conclude that body weight of runners mostly contributed by lean tissue than fat.

References:
5) Pipes TV; 1977 Body composition characteristics of male and female track and field athletes. ;Q.197;48:244-47
8) Sodhi HS, Siddhu LS; Physique and selection of sportmen.