

Clinical Journal of Sport Medicine

Are differences in anthropometric measurements, speed, strength and sport-specific skills evident in young sub-elite soccer players with different skeletal age?

--Manuscript Draft--

Manuscript Number:	CJSM-23-383
Full Title:	Are differences in anthropometric measurements, speed, strength and sport-specific skills evident in young sub-elite soccer players with different skeletal age?
Article Type:	CASEM Annual Symposium Abstract - Poster
Corresponding Author:	Georgiy Malyakin, MD I.M. Sechenov First Moscow State Medical University Moscow, RUSSIAN FEDERATION
Corresponding Author Secondary Information:	
Corresponding Author's Institution:	I.M. Sechenov First Moscow State Medical University
Corresponding Author's Secondary Institution:	
First Author:	Eduard Bezuglov, DMSc, MD
First Author Secondary Information:	
Order of Authors:	Eduard Bezuglov, DMSc, MD Anton Emanov Andrei Burlakov Zhanna Emanova Vyacheslav Kolesnichenko Elizaveta Kapralova, MD Georgiy Malyakin, MD Ryland Morgans, PhD
Order of Authors Secondary Information:	
Abstract:	<p>Objective: To examine any differences in anthropometric measurements, speed, strength and sport-specific skills of young sub-elite soccer players with different skeletal age in U11 and U12 teams.</p> <p>Study Design: Cross-sectional study.</p> <p>Subjects: 103 youth soccer players from six second division academies that participated in an experimental tournament (age 140 ± 6.8 months, height 150.2 ± 14.2 cm, weight 39.9 ± 12.5 kg, BMI 17.5 ± 3.8 km/m²).</p> <p>Intervention: Anthropometric measurements (height, weight, body mass index), maturity status (Khamis-Roche formula), and skeletal age (BAUSport™ Sonic Bone ultrasound device) were conducted. The physical qualities and sport-specific skill tests consisted of: 5-, 10-, 20- and 30-m sprint, countermovement jump, horizontal jump, agility T-test, change of direction, and football specific dribbling circuit. All study participants were sub-divided into four groups depending on the skeletal age quartile.</p> <p>Outcome Measures: The outcome measurements were anthropometric measurements data, skeletal age in months, physical qualities and sport-specific skill tests results.</p> <p>Results: skeletal age in the study sample ranged from 117 to 175 months (142 ± 12.1 months). Comparison of skeletal age percentile groups showed significant differences in chronological age ($p < 0.001$), height ($p < 0.001$), weight ($p < 0.001$) and BMI ($p = 0.008$). However, participants with the youngest skeletal age did not differ from more mature peers in terms of speed, strength and sport-specific skills ($p < 0.05$). A significant difference was only reported in the horizontal jump between the 2nd and 4th quartile ($p = 0.004$).</p> <p>Conclusions: A team may consist of young players whose skeletal age significantly</p>

differs by more than 30 months. However, compared to more mature players, less mature youth soccer players differ in stature and weight but are equal in speed and strength qualities. Thus, it is likely that the presence of other qualities, namely technical and tactical, contribute to soccer success allowing less mature young players to compete with larger peers and remain within academy systems.

Abstract Title: Are differences in anthropometric measurements, speed, strength and sport-specific skills evident in young sub-elite soccer players with different skeletal age?

Author Names: Eduard N. Bezuglov, DMSc, MD¹, Anton Yu. Emanov¹, Andrei G. Burlakov², Zhanna Yu. Emanova¹, Vyacheslav P. Kolesnichenko¹, Elizaveta S. Kapralova, MD¹, Georgiy I. Malyakin¹, MD, Ryland Morgans, PhD¹

Affiliations: ¹ High Performance Sports Laboratory, Sechenov First Moscow State Medical University, Moscow, Russia

² Russian Football Union, Moscow, Russia

Objective: To examine any differences in anthropometric measurements, speed, strength and sport-specific skills of young sub-elite soccer players with different skeletal age in U11 and U12 teams.

Study Design: Cross-sectional study.

Subjects: 103 youth soccer players from six second division academies that participated in an experimental tournament (age 140 ± 6.8 months, height 150.2 ± 14.2 cm, weight 39.9 ± 12.5 kg, BMI 17.5 ± 3.8 km/m²).

Intervention: Anthropometric measurements (height, weight, body mass index), maturity status (Khamis-Roche formula), and skeletal age (BAUSport™ Sonic Bone ultrasound device) were conducted. The physical qualities and sport-specific skill tests consisted of: 5-, 10-, 20- and 30-m sprint, countermovement jump, horizontal jump, agility T-test, change of direction, and football specific dribbling circuit. All study participants were sub-divided into four groups depending on the skeletal age quartile.

Outcome Measures: The outcome measurements were anthropometric measurements data, skeletal age in months, physical qualities and sport-specific skill tests results.

Results: skeletal age in the study sample ranged from 117 to 175 months (142 ± 12.1 months). Comparison of skeletal age percentile groups showed significant differences in chronological age ($p<0.001$), height ($p<0.001$), weight ($p<0.001$) and BMI ($p=0.008$). However, participants with

1 the youngest skeletal age did not differ from more mature peers in terms of speed, strength and
2 sport-specific skills ($p < 0.05$). A significant difference was only reported in the horizontal jump
3 between the 2nd and 4th quartile ($p = 0.004$).
4

5 **Conclusions:** A team may consist of young players whose skeletal age significantly differs by
6 more than 30 months. However, compared to more mature players, less mature youth soccer
7 players differ in stature and weight but are equal in speed and strength qualities. Thus, it is likely
8 that the presence of other qualities, namely technical and tactical, contribute to soccer success
9 allowing less mature young players to compete with larger peers and remain within academy
10 systems.
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65