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Abstract Book

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# **Book of Abstracts**

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Kolmogorov-Smirnov test. Subsequent regression analyses examined the relationship between the number of soccer players per age group and the corresponding month of birth. 'Month 1' is defined as the start (group 1 = Aug; group 2 = Jan) while 'month 12' (group 1 = Jul; group 2 = Dec) is the end of the selection year.

Kolmogorov-Smirnov tests exposed different distributions across the 12 months.

Regression analyses revealed clear relationships between month of birth and number of soccer players for group 1 (adj.  $R^2=0.72$ ,  $p<0.001$ ) and group 2 (adj.  $R^2=0.40$ ,  $p<0.001$ ). For group 1, the number of births is high in August and September (beginning of the selection year) and decreases progressively afterwards. The spreading in births of the youngest group of players shows a bimodal curve. An extreme peak in August interrupts the gradual decrease from the beginning (January) to the end (December) of the new selection year.

Results also clearly indicate a shift in month of birth distribution. The first quarter of the selection year still 'generates' more players (group 1: 28.8%; group 2: 31.5%) whereas births remain least frequent in the last three months (group 1: 19.9%; group 2: 19.5%).

In accordance with previous studies, birth-date distributions of national senior soccer players are significantly biased towards a higher number of births during the early part of the selection year. These data provide evidence that a shift in birth-date distribution of senior national soccer players has occurred since the change of the cut-off date in 1997.

#### P10M-04

### Comparison of a 10 weeks resistance strength training program on prepubescent girls and boys

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*Keywords: strength training*

The purpose of this study was to investigate the effects of a 10 weeks resistance training program on the development of the maximal isometric strength, muscle thickness, contracted brachial perimeters, relaxed brachial perimeters, push-ups, pull-ups and throwing a roller-skate hockey ball in prepubescent girls and boys.

The sample was divided into two different groups, the experimental group (EG,  $n=17$ ) and the control one (CG,  $n=17$ ) and comprises 20 girls ( $9.44 \pm 0.28$  years) and 15 boys ( $9.34 \pm 0.30$  years) in the maturation stage I according to Tanner's Scale. The EG group was submitted to a training program with callisthenic exercises three times a week (90 minutes each session) during 10 weeks. The program consisted of training push-ups, modified pull-ups and 2 exercises with elastics (elbows flexion and extension and extension of the arms above the head) until exhaustion. The training volume was gradually adapted from 3 series between the 1st and 3rd week to 4 series between the 4th and 6th week and to 5 series between 7th and 10th week.

The results suggested that prepubescent children can increase strength following a strength training program that includes callisthenic exercises. This training program does not seem to have a significant effect in the development of the FIMV. The strength gains were not followed by an increase of muscle mass. In this study we only evaluated the neuromuscular factors (EMG) in FIMV and the alterations of the neuromuscular activations were not significant. It seems that the elements underlying the increase and strength gains

can be related to the increase of the coordination of the movement. The coordination seems to be an element that highly contributes to the increase of strength for more complex exercises.

#### P10M-05

### Effects of strength training and diet on health markers in aging women

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*Keywords: strength training, aging, nutrition*

This study examined effects of strength training (ST) and diet on health markers.

27 middle-aged women (MW:  $52.9 \pm 2.3$  yrs, BMI  $24.8 \pm 3.2$  kg/m<sup>2</sup>, body fat%  $28.2 \pm 5.4$ , 1RM leg press  $107.7 \pm 19.7$  kg) and 24 older women (OW:  $64.6 \pm 4.5$  yrs, BMI  $26.1 \pm 3.2$  kg/m<sup>2</sup>, fat%  $30.4 \pm 5.9$ , 1RM leg press  $96.5 \pm 23.2$  kg) were randomly divided in two groups: 1) ST+nutritional counseling (NC), and 2) ST+no-nutritional counseling (NNC). Supervised progressive ST was performed two times a week for 21 weeks. NC was handled at week 0 and 10.5 in an attempt to guarantee sufficient energy and protein intake, proper balance of nutrients, and healthy aspects of diet. Dietary intake (DI) was recorded by 4 days dietary diaries and health markers (resting blood pressure, resting heart rate, fasting blood health markers) using standard analyses.

At week 21 1RM leg press had increased significantly ( $p<0.001$ ) in all groups by 26-29%. There were no differences in DI between the MW groups at week 0, but after NC energy intake was higher in ST+NC group at week 2. Some differences were observed between the OW groups in DI at week 0, but after NC DI became similar already at week 2.

After ST resting systolic blood pressure had decreased in both MW groups and resting diastolic blood pressure in MW ST+NC only. No significant changes were noticed in resting heart rate. Fasting blood glucose level had decreased in MW and OW ST+NC. Erythrocyte sedimentation rate had increased significantly in all groups. Blood haemoglobin had decreased in OW and MW ST+NNC, and packed cell volume in OW. Serum total cholesterol had decreased in OW, serum high-density lipoprotein cholesterol had increased in all groups, and serum low-density lipoprotein cholesterol had decreased in OW and MW ST+NNC. No changes were observed in serum triacylglycerols.

Strength training produced favorable changes in resting blood pressure, fasting blood glucose concentration and serum lipids. Nutritional counseling further contributed to health markers of resting diastolic blood pressure, resting blood haemoglobin and serum triacylglycerols in middle-aged women, and fasting blood glucose in older women. The data showed that strength training alone favourably affected health markers, and that nutritional counseling even contributed to positive changes of selected health aspects. Further research is needed to study whether nutritional counseling given more frequently would lead to more potent positive influences on health markers in both men and women.