



# Performance adaptation in young amateur soccer player after a technical balance training protocol

Gualtieri D., Galimberti L., Gaeni M., Alberti G.

Institute of Physical Exercise, Health and Sport Activity, Faculty of Exercise Sciences, University of Milan, Italy



UNIVERSITÀ DEGLI STUDI DI MILANO

FACOLTÀ DI SCIENZE MOTORIE

## Introduction

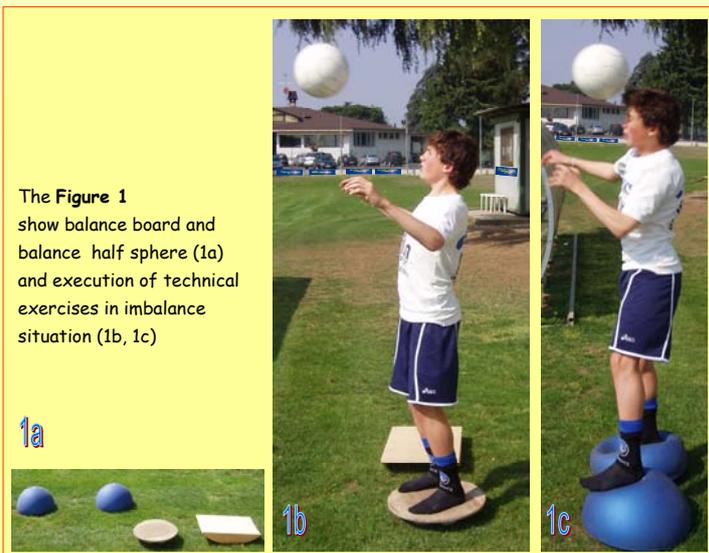
In the literature there are little studies comparing the effects of isolated proprioceptive training (balance training, BT) with those of strength training (1). Balance training seems to improve the muscular strength, with the advantage of reduce eventual imbalances between corresponding limbs (2).

## Methods

Purpose of the experimentation was to verify if the BT on young soccer player influences capacity of vertical jump, sprint and balance. Eighteen young male soccer players ( $12.0 \pm 0.2$  years), were homogenously divided in two groups: experimental (GBT) and control (GC). Both groups did 6 weeks protocol of training involving two weekly sessions (total: 12 sessions of 25 minutes each). GBT group carried out exercises with and without the ball in situation of imbalance while GC group performed specific exercises for the development of individual technical abilities.

To evaluate strength, all subjects performed, before and after the training period, a series of 3 vertical jumps (Counter Movement Jump) free arms (CMJbl), both legs support and with one leg support (Optojump, Microgate, Bolzano, Italy). The speed in a 20m sprint was measured by photocells. Balance was appraised upon electronic footboard (Libra, Easyteach, Prato, Italy) with 2 different test. Test a): balance maintenance for 30s, open eyes, look on a fixed point at eyes height, both legs support and low flex knee, oscillation on frontal plan. Test b): same test but every 5s were performed a  $\frac{1}{2}$  squat with return to the position of low flex knee.

Statistical analysis was made using Wilcoxon Signed ranks test (significant value  $P < 0.05$ ).



The Figure 1 show balance board and balance half sphere (1a) and execution of technical exercises in imbalance situation (1b, 1c)

## Results

Group GC showed a significant worsening in both balance tests after training (Table 1). In GBT Group, performance improved significantly in sprint and in CMJbl carried out with right leg (prevailing leg for all).

| CMJ free arms Both leg |        | CMJ free arms right leg |         | CMJ free arms left leg |        | Sprint 20 m |         | Balance test 1 |        | Balance test 2 |        |
|------------------------|--------|-------------------------|---------|------------------------|--------|-------------|---------|----------------|--------|----------------|--------|
| GC                     | GBT    | GC                      | GBT     | GC                     | GBT    | GC          | GBT     | GC             | GBT    | GC             | GBT    |
| +2%                    | +6%    | +5%                     | +15%    | +2%                    | +8%    | +1%         | +3%     | -20%           | +4%    | -11%           | +4%    |
| P<0.05                 | P<0.05 | P<0.05                  | P=0.028 | P<0.05                 | P<0.05 | P<0.05      | P=0.017 | P=0.013        | P<0.05 | P=0.028        | P<0.05 |

Table 1 and Figure 2: show differences (in percentage) of performance in test for experimental and control group. Significant value using Wilcoxon Signed Ranks Test

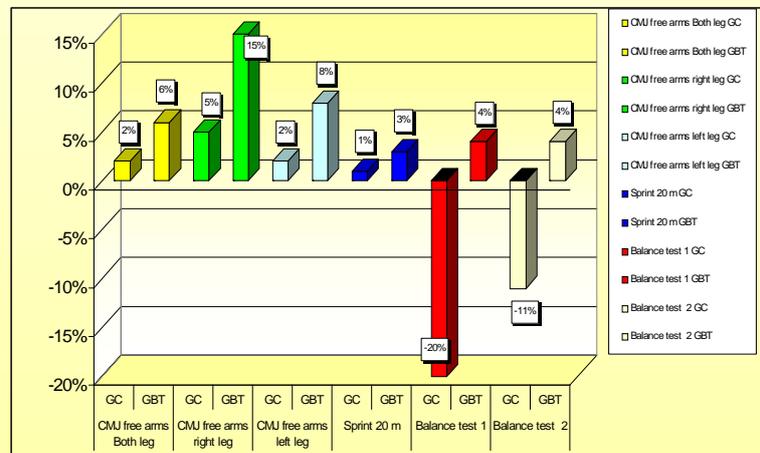


Figure 3: The graph show the performance improvement % in different test for the two groups

## Discussion/Conclusions

BT seems to be a stimulant for sprint ability and capacity of strength on one leg support with prevailing limb. In young soccer players it may be optimal to introduce some programs of BT to favour the development of proprioceptive capacity and balance, during exercise training. This will constitute a preventive action about accidents and re-accidents of the inferior limbs, applicable to soccer.

## References

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