

Amsterdam Sunday, August 25, 2002

About womens volleyball.

There are two items here:

- 1 - Monthly cycle and training in women
- 2 - Training according to muscle fiber type or (better) explosive nature.

First about womens monthly cycle (MC). With individual sportswomen I always inquire about pill and MC. First of all, women have more patellar femoral (patellar tendon --> especially) problems than men....

But if they use the pill, the number of these injuries drop to almost half !!!!!

So they should use the pill... But if they do then there is a different situation in their need for certain vitamins etc. I also look at what pill they use --> the relation between the main ingredients: (ethinyl) estradiol, being the estrogen and (e.g.) levonorgestrel, being one of the common progestogens.

Secondly, if you like to use the MC to optimise the (responses to!) training..... you should put 60% of the total work before the ovulation and 40% after (Schmidbleicher). But if a woman uses the pill this is not true anymore..... several things messed up.... etc.

What I do is let women determine (put on paper eg) how they feel about training and especially the training response in the different weeks of the cycle. Some women have different training weeks before, during or after their period, others say there is no difference in their performance (measured in cm, sec and/or kg). Of course this is easier in individual sports.

Training and muscle fiber type.

For the last 5 years I regularly tested all TVN (Top Volleybal Nederland) players.

I used 3 tests:

- 1- Squat Jump: SJ.
Jump from a static position.
- 2- A Counter Movement Jump: CMJ.
This test is not a standard test. The player runs towards the contact mat, places his feet and jumps. The contact mat registers contact time before the jump (!) and the jump time (=jump height). You see different players using different contact times even though they show the same jumping heights.....
- 3- 15 seconds jumping to determine anaerobic power --> watt/kg bodyweight
This last test not done as often as the first two.

I published in 1998 about the relation between tests 1 and 2. The first test has higher correlation with maximum strength, eg olympic weightlifters being the best performing group among sports. The second test is much closer to volleyball because of the CMJ form a running approach. See --> Publication

The Counter Movement Jump

Our CMJ protocol describes a more volleyball specific test. Here we can see the players capability to translate horizontal speed into vertical jump height. Coordination and jumping power under pre stretch conditions determine the result. The software tests for contact time (contact with the mat before the vertical jump) and flight time (vertical jump time).

Considering the many short term actions in volleyball, we could (?) view the jump of player 0036 (Table 4 test 3, contact time: 0.22) as being superior to the jump of player 0038 (Table 4 test 3, contact time: 0.34)... Hopefully more data in future will show us if a certain player more or less ‘needs’ the same contact time whenever making a maximum performance jump.

The instruction in the test was: ‘jump as high as possible’ so there could be a relation between the measured contact time and the immediate following maximum jump performance.

The relation between Squat Jump and Counter Movement Jump

Strength is an important factor in improving jumping ability. The SJ value reflects the volleyball players’ explosive power and strength training will strongly affect it. In volleyball the jumping is done with the use of pre-stretch. We express this using the CMJ, and it’s protocol as described earlier.

The relation between both is as follows: $P = (CMJ / SJ) * 100$

The hypothesis is that the SJ, mainly being influenced by strength training, delivers basic strength needed to improve the pre stretch performance seen when testing the CMJ. The SJ value is particular high in athletes and olympic weight lifters. The SJ is small in power lifters because they train with big (maximum) weights and show low power output mainly because of the low speed with which the weights are being lifted. The task for the olympic lifter is to accelerate a relatively small weight to great speed. The P-value could be a help to determine what kind of training is useful for a certain player. Talented players should show a SJ value of 0.60 or more. Based on the data we have so far, a CMJ should be 0.70 or more. Since the software and contact mat are cheap and easy to use we hope to collect more data in the future from trainers in the national competitions.

A small P value nearly always caused by a small CMJ value in which case we often see that both values are relatively small. In both cases we expect training with extra attention to plyometrics will lead to a higher P value and a better CMJ. This training will consist of plyometrics like depth jumps, standard volleyball training and more classical forms of strength training using free weights.

A high value of P together with an average CMJ means that the SJ value is (too?) small and weight training is an important method to try to improve the ‘basic’ power needed for a good SJ performance.

Table 2. Top League - High ranked

ID	AGE	NR	DATE	J-1	J-2	CONTACT+JUMP	P-value	
68	24.6	1	09/08/99	0.57	0.56			
68	24.11	2	08/12/99	0.59	0.60	0.34	0.69	115.0
64	26.2	1	09/08/99	0.58	0.57			
64	26.7	2	08/12/99	0.64	0.64	0.20	0.74	115.6
3	32.5	1	09/08/99	0.58	0.57			
3	32.11	2	08/12/99	0.63	0.65	0.32	0.71	109.2
66	24.11	1	09/08/99	0.54	0.56			
66	25.5	2	08/12/99	0.60	0.62	0.27	0.73	117.7
70	34.2	1	09/08/99	0.51	0.50			
70	34.7	2	08/12/99	0.56	0.58	0.19	0.72	124.1
67	28.5	1	09/08/99	0.54	0.56			
67	28.11	2	08/12/99	0.58	0.60	0.25	0.60	100.0

Here are some values to orientate:

Table 7.

Women:	Number: n =	Maximum jump: average value in sec. *)	Range total group: Lowest and highest values in sec.
Handball top league	n = 23	0.41	0.36 – 0.49

Table 8.

Men:	Number: n =	Maximum jump: average value in sec. *)	Range total group: Lowest and highest values in sec.
Soccer: first league	n = 23	0.49	0.44 – 0.57
Volleyball: first league	n = 7	0.54	0.48 – 0.57
Volleyball: top league	n = 12	0.59	0.51 – 0.61
Soccer: youth 12-14 years	n = 22	0.45	0.41 – 0.50
Soccer: youth 15-17 years	n = 20	0.47	0.41 – 0.54
Soccer: youth 16-18 years	n = 13	0.49	0.44 – 0.55

(Vos, Leenders 1997-1999)

*) Average highest values out of two jumps.

Now here's something I did last summer with the men's team. They performed both tests, and from earlier experience I drew the line between good and less good at 0.60s for the SJ and 0.72 for the CMJ. So every player has scores + (good) and – (less good) for both tests.

A got four groups:

VOLLEYBAL DUTCH TEAM 15 juli 2001

GROEP I SJ - CMJ-

5 persons – Both values not OK. The training is a mix of strength methods and jumps.

GROEP II SJ- CMJ+

3 persons – The training focuses on classic strength methods.

GROEP III SJ+ CMJ-

3 persons – The training focuses on jumps and coordination. This is the most difficult group because you'd like to offer them 'depth jump like' training... but this could be too much for a volleyball player (especially women). But it's not strength the lack.

GROEP IIII SJ+ CMJ+

5 persons

This group starts the 'normal' routine

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