

Taekwondo and Myoinositol Supplementation on Regularization of Menstrual Cycle in Adolescent Athletes: One Year Follow up Observational Study

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Abstract

The objective of this study was to retrospectively analyze the effect of DCI on menstrual cycle regularity in taekwondo young athletes practice. Data analysis and current status of literature are reported.

Enrolled in the study 23 athletes aging 10-17 years performing taekwondo at least twice a week, in the last twelve months. No distinction was done about presence or not of ultrasound sign of polycystic ovarian syndrome, when the enrollment of case started.

All adolescent taekwondo athletes with irregular cycles (oligo/amenorrhoea) were treated with Myoinositol, for twelve months, 1000 mg daily.

Our data suggest that there is a significant improvement regarding the reduction of oligomenorrhoea in the group enrolled: probably this hypothesis has multiples causes and different physiopathology.

Keywords: Amenorrhoea; Puberty; Polycystic; Menstrual cycle

Objective

The objective of this study was to retrospectively analyze the effect of DCI on menstrual cycle regularity in taekwondo young athletes practice. Data analysis and current status of literature are reported.

Design

Retrospective study

Methods

Enrolling in the study athletes aging 10-17 years, offering from two famous taekwondo society sited in Italy (Genoa and Carasco-Portofino).

Recruitment of cases started in January 2015 until January 2016.

Characteristics of this group were that they were performing taekwondo at least from one year for two workshops a week.

All participants were scheduled by physical examination excluding medical pathologies and scanned by transabdominal ultrasound excluding pelvic pathology.

No distinction was done about presence or not of ultrasound sign of polycystic ovarian syndrome, when the enrollment of case started.

All adolescent taekwondo athletes with irregular cycles (oligo/amenorrhoea) were treated with myoinositol, for twelve months, 1000 mg daily.

Using an anonymous questionnaire (Questionnaire 1), after obtaining their parents' consent, we collected information about onset of puberty, menstrual frequency, body fat index, pelvic pain or cyclic pelvic pain, previous osteitis or previous surgery, use of drugs.

One year later they were contacted to report their experience on menstrual cycle regarding the regularity of menses.

Results

Enrollment in the study regarded the 95,65% of available cases (in one case the consent was not obtained) for a total of 23 athletes.

Taekwondo athletes (TKDa) mean age was 14,8 (11-17) years versus 14,5 of the group control and the median period from which started the Tkd fitness was 3,6 years (1-9).

Regarding TKDa the median BMI was 18,91 revealing that TKDa BMI was significantly lower than that of the normal Italian adolescent.

There was no significative difference between the age at menarche (11,8 TKDa and 12,3 respectively).

Menstrual irregularities were reported in 66,7% of the TKDa, divided for the TKDa in 57,5% oligomenorrhoeic and 9,2% amenorrhoeic.

Dysmenorrhoea was reported in 80% of TKDa divided in 41,6% reporting mild dysmenorrhoea and 58,4 reporting severe dysmenorrhoea.

46,6% were confidential with Fans during menstrual cycle versus 54,9% in the group control, while there were previous abdominal surgery or osteitis in one case of TKDa versus none cases of controls.

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Data Collecting Schedule

0. Practice years.....
1. Date of birth.....
2. Weight..... High.....
3. Menarche.....
4. Oligomenhorrea / irregular cycle
5. Amenorrhoea.....
6. Dysmenorrhoea:
Severe Mild
7. Fans use: during cycle
Yes No
8. Pubic osteitis/pubalgy:
Yes No
9. Have you noted a benefit in dysmenorrhoea since you regularly train with taekwondo?
Yes No
10. Have you noted a benefit on regularity of menstrual cycle since you regularly train with taekwondo?
Yes No
11. Is your weight higher since you regularly train with taekwondo?
Yes No
12. In case of spine problems, have you noted a benefit since you regularly train with taekwondo?
Yes No

Questionnaire 1: adolescent practicing taekwondo, aging 10 -17, training at least twice a week, in the last twelve months.

60% reported an improvement on regularity of menses after one year continuative training associated with Myoinositol therapy and 26,7% referred a regularization of menstrual cycle only after tkd exercise but without supplementation by inositol.

The percentage of adolescent reporting regular menstrual cycles significantly increased with increasing duration of DCI treatment (23% and 57.9% at a mean of 3 and 6 months of treatment, respectively). No side effects were reported during the observation.

BMI after one year was not changed in 73,3% of TKDa and reduced in 13,3% of cases. The cases in which BMI was enhanced resulted in 13,4% of cases.

Discussion

Problems associated with menstruation affect 75% of adolescent females and are a leading reason for visits to physicians [1,2].

Timing and characteristics of normal menstruation during adolescence are various but often complicated by pelvic pain or chronic pelvic pain.

The effectiveness of myoinositol treatment in improving insulin resistance in PCOS patients and oligomenorrhoeic patient has been confirmed in several reports [3].

There are no studies in literature regarding the link between

taekwondo in the adolescents and menstrual disorders and a Medline research revealed no publications in this topic.

Some studies refer to body fat mass in female adolescent training in taekwondo [4], one particularly [5] revealing that low frequency taekwondo training in adolescent females produces beneficial changes in skeletal muscle fitness, flexibility, and body composition in a relatively short period of time.

Consequently Kim et al. suggest that this specific type of training can be useful to female adolescents in structured school environments where physical education classes are limited and there is little free time for physical activity [5] and, based on our research, this kind of activity could be useful especially in adolescent with high BMI or polycystic ovaries.

Inositol is a physiological compound belonging to the sugar family. The two inositol stereoisomers, myo-inositol and D-chiroinositol are the two main stereoisomers present in our body and Myo-inositol is the precursor of inositol triphosphate, a second messenger regulating many hormones such as TSH, FSH and insulin. D-chiroinositol is synthesized by an insulin dependent epimerase that converts myo-inositol into D-chiro-inositol and in patients with patient's myo and/or D-chiro-inositol administration improves insulin sensitivity and seems to be an optimal approach for the treatment of PCOS disorders and menstrual disorders [6].

It is known that the underlying etiology of PCOS remains not clear but it is commonly associated with menstrual irregularities and insulin resistance especially in obese adolescents and it is often indistinguishable from the clinical manifestations of PCOS, indicating a diagnostic dilemma due to higher circulating androgens during puberty [7].

The symptoms correlated to hyperandrogenemia, independent of obesity, in postmenarchal adolescents is associated with increased risk of cardio metabolic syndrome and therefore, treatment strategies including lifestyle changes and/or use of insulin-sensitizers are needed.

Our data suggest that there is a significant improvement regarding the reduction of oligomenhorrea in the group enrolled: probably this hypothesis has multiples causes and different physiopathology's Several observational studies reported that exercise and physical activity reduce the prevalence of menstrual disorders and dysmenorrhea and there are several plausible mechanisms by which exercise might be effective in the management of this condition [8]; from experimental studies appears that exercise may eliminate or reduce the need for medication to control menstrual cramps and other associated symptoms [8].

Other studies found no significant association between exercise

and menstrual cycle but often data are insufficient and empirical: Romano et al. [9] report for example about a possible association between fallopian tube torsion in adolescent and sports causing rapid body movements [9].

Recently Vitagliano et al. [10] report about possible adverse effects of empiric supplementation of inositol in normal weight patient not affected by polycystic ovarian syndrome.

This consideration is linked with our study but data are discordant because in our little series we found a benefit.

In conclusion our study suggests a positive role and a new way to conceive sports and particularly taekwondo, revealing reduced oligomenhorrea when correlated to inositol supplementation in adolescent.

The multifactoriality of the problem associated to the few cases enrolled in the report nowadays does not permit sure statements.

Data are promising but further bigger studies are needed.

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