Caring for Female Wrestler: What Her Coach Needs to Know

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Caring for the Female Wrestler: What Her Coach Needs to Know

Carole Maître

ABSTRACT. Women’s wrestling has specificities in its recent history, development, and the treatment of female wrestlers. First, women’s wrestling has been an Olympic Sport since 2004; this results in a limited number of medical scientific publications. Second, women’s wrestling is a weight class sport, which includes difficulties in managing the weight and risk of amenorrhea and athlete triad. Third, women’s wrestling is a combination of tactical, technical, and strength training; it involves an imbalance between the force of the abdominal muscles and the pelvic floor, which increases the risk of pelvic floor dysfunction. The author conducted a study on French elite female wrestlers to approach the reality of the health issues that female wrestlers face. In this study, 7 female wrestlers filled out an anonymous survey. Results showed that 5 women reported premenstrual syndrome, 3 reported amenorrhea, 3 reported pelvic floor dysfunction, 2 reported disturbances of cycles, and 1 reported stress fracture. Bone mass density of the amenorrheic female wrestlers was not decreased per dual-energy x-ray absorptiometry. Caring for the female wrestlers concerns several individuals including the coach, the trainer, the sport physician, the gynecologist, the sport dietitian, and the sport physiologist, in consideration of the female wrestler, her need of training, her level of performance, and her health status.

Keywords: amenorrhea, athlete triad, body composition, cycle disturbance, female wrestler, pelvic floor, strength training, stress fracture, weight management, women’s wrestling

The level of care needed for female wrestlers is determined by the specificities of the female physiology as well as the women wrestlers themselves. Is there an impact of female wrestling on the female physiology? Does this impact play a role on women wrestlers’ performance and health? The issues stemming from the effects of energy availability (when caloric intake does not match the expenditure of energy from training) on menstrual cycles; and more recently, pelvic floor dysfunction found in high level sports training with strong abdominal contractions, can have health and performance consequences (Bo & Borgen, 2001; De Souza, Lee, Van-Heest, Scheid, West, & Williams, 2007; De Souza, Toombs, Scheid, O’Donnell, West, & Williams, 2010). They have been studied in elite female athletes in a number of sports. These issues, as well as others that may be specific to women wrestlers, were discussed at the Scientific Symposium organized by the International Network of Wrestling Researchers, held at the 2015 Wrestling World Championships in Las Vegas. What have we found, in its relatively short history, to be the issues that are present in female wrestling?

First, women’s wrestling has been an Olympic Sport only since 2004; nevertheless, women’s wrestling had been ready for a long time, as the first World Championships were held in 1988. France was the birthplace of modern women’s wrestling. With the additional development in Norway and Belgium, the first international commission for women’s wrestling met in 1983, and the unique style called female wrestling was established in 1987 (Curby & Jomand, 2015). With the participation of Norway and Belgium, the constitution of the 1st Commission for Wrestling for Women in 1983, established a unique style called female wrestling in 1987. The rapid development of women’s wrestling results in a limited number of scientific medical publications on the specificities of women’s wrestling, compared with other female sports in high level.

Also, women’s wrestling is a weight class sport; four weight classes in the 2004 Olympic Games recently increased to six weight classes for the 2016 Olympic Games. This issue is important in relation to the difficulties to manage the weight, and the risk of amenorrhea and athlete triad, when the weight loss is quick before the competitive period. This effect is well known among weight class sports such
as judo, karate, taekwondo, and boxing. The decision to increase the number of weight classes would realize a first step to decrease the risk.

Women's wrestling is a combination of technical, tactical, and strength training, which require a high level of endurance and physical fitness with the increased risk of pelvic dysfunction. It is linked to the imbalance between the strength of the abdominal muscles and the pelvic floor.

To approach the reality of the health issues in female wrestlers, it was decided by the French Sport Institute (INSEP) to administer an observational study with a survey of 10 major items related to female wrestling (see Table 1). Nine elite female wrestlers responded to this survey during the mandatory medical examination. The INSEP wrestling team is the team that prepares for the Olympic Games.

The survey did not include eating disorders because, by experience, when eating disorders are present, menstrual disturbances follow. The first three items concern the slowdown of the reproduction axis (among hypothalamus, hypophysis, and ovarian); the fourth item concerns the possible clinical consequence of the disturbance on the bone mass density. Item 5, 6, and 7 are related to premenstrual syndrome (PMS)—the first stage of the slowdown of the reproduction axis; items 8 and 9 are related to the hormonal contraception, which could mask cycle disturbances. The last item is related to the dysfunction of pelvic floor. A positive response is a starter to complementary examination.

### RESULTS

The reported results (see Table 2) concern the French team, composed of 9 elite female wrestlers in Olympic Games preparation, with an average of 20 hr per week of training at The French National Sport Institute. Seven elite athletes filled out the survey, and the average age was 23 years.

- Three out of seven athletes had cycle disturbances, and 1 had stress fracture.
- Five out of seven athletes had at least one sign of premenstrual syndrome, leading to difficulties in regular training.
- Three out of seven athletes had pelvic floor dysfunction; for 2 athletes, a complementary survey on the trigger factors of urinary incontinence was completed, and the more common triggering factor was the abdominal muscle training.

According to the results, 2 female wrestlers underwent a DXA scan for bone mineral density testing, whereas the third was abroad and the DXA scan was delayed. The indication for obtaining a DXA scan for bone mineral density testing in an elite athlete is reported in the 2014 Female Athlete Triad Coalition Consensus (Nattiv et al., 2007). This consensus is written as a supplement to the American College of Sports Medicine revised position stand on the Triad published in

### TABLE 1 The 10 Statements in Sport Gynecology

<table>
<thead>
<tr>
<th>Statement</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. My first period happened after 16 years old</td>
<td>Yes</td>
<td>no</td>
</tr>
<tr>
<td>2. I have had amenorrhea during more than 3 months</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>3. I have had disturbance of my periods</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>4. I have had a stress fracture or several</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>5. Dysmenorrhea disturbs my training</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>6. I gain weight before each period</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>7. I am tired before each period</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>8. I take the pill, I would like to take the pill, or I have changed my pill</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>9. I have forgotten my pill</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>10. I have some UI, often, sometimes, or rarely</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

Note. This refers to hormonal contraception. UI = urinary incontinence.

### TABLE 2 Participants' Responses to the 10-Item Survey (N = 7)

<table>
<thead>
<tr>
<th>Statement</th>
<th>Number of &quot;yes&quot; responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. My first period happened after 16 years old</td>
<td>2</td>
</tr>
<tr>
<td>2. I have had amenorrhea during more than 3 months</td>
<td>3</td>
</tr>
<tr>
<td>3. I have had disturbance of my periods</td>
<td>2</td>
</tr>
<tr>
<td>4. I have had a stress fracture or several</td>
<td>1</td>
</tr>
<tr>
<td>5. Dysmenorrhea disturbs my training</td>
<td>4</td>
</tr>
<tr>
<td>6. I gain weight before each period</td>
<td>3</td>
</tr>
<tr>
<td>7. I am tired before each period</td>
<td>2</td>
</tr>
<tr>
<td>8. I take the pill, I would like to take the pill, or I have changed my pill</td>
<td>3 with contraception + 1 would change implant versus pill</td>
</tr>
<tr>
<td>9. I have forgotten my pill</td>
<td>0</td>
</tr>
<tr>
<td>10. I have some UI, often, sometimes, or rarely</td>
<td>3</td>
</tr>
</tbody>
</table>

Note. This refers to hormonal contraception. UI = urinary incontinence.
Menstrual disturbances and amenorrhea are more common and reported in weight class sports (e.g., judo, karate, wrestling, boxing, and rowing) and in early prepuberty sports; however, there are only a few publications on issues concerning women’s wrestling (Maitre, 2013).

The menstrual disturbances and amenorrhea are induced by insufficient energy availability for the good function of pituitary axis. It is a loss of the energetic balance with a low-energy-availability threshold that causes a slowdown of the axis of reproduction. Many endocrine mediators and neurotransmitters such as leptin, peptide YY (also known as peptide tyrosine tyrosine), and ghrelin involved directly or indirectly through energetic balance to slow hypothalamic pulsatile gonadotropin-releasing hormone (GnRH) and production of ovarian steroids (Gomez-Merino, Chennaoui, & Guezennec, 2004; Russel & Misra, 2010; Scheid & De Souza, 2010). This state of hypometabolism is intended to guide the energy availability to vital organs and muscle activity. The estrogen rate is low; nevertheless, it is well known that estrogen has an active part in the energetic metabolism in that estrogen contributes to glycogen storage, lipid metabolism, muscle adenosine monophosphate (AMP) kinase activity, and maintenance of the bone mass density to prevent stress fracture and injuries. It is clear that a low estrogen rate should be considered to be a significant risk of reduced performance.

The PMS and irregular periods are directly the clinical consequences of this slowdown of the axis of reproduction with a low estrogen rate. The first symptoms are usually the PMS, then the disturbance of menstruation and amenorrhea; it depends on the speed of weight loss and the threshold of energetic availability. In corollary, the elite female athlete has a disturbance of bone metabolism, with possible osteopenia, osteoporosis, and an increased risk of stress fracture. Amenorrhea, low energetic availability and osteoporosis constitute the three major components of the athlete triad; all the spectrum of symptoms between the physiologic status and the complete pathologic status has the same consequences. A later outcome is the disturbance of the endothelial function with increased risk of atherosclerosis, depending on the low estrogen rate (Ihle & Loucks, 2004; Lambrinoudaki & Dimitra, 2010; Lanser, Zach, & Hoch, 2011; O’Donnel & De Souza, 2004).

The female athlete in our study who has a stress fracture had quick loss of weight (5 kg) and irregular menstrual cycles; nevertheless, the work of the back muscles has compensated the hormonal risk, the stimulation of osteogenesis could keep a positive and sufficient role during 1 to 2 years and delay osteopenia.

These disturbances should be known and treated early to preserve as the health of the athletes, that the performance but the diagnostic is often delayed, because amenorrhea is experienced as very convenient by the athlete and her sport entourage (Ducher, Turner, & Kukuljan, 2011; Witkop & Warren, 2010).

**Taking Care of Female Wrestler and the Female Athlete Triad**

The first line is a preventive line. The following key points are important to consider when weight loss is necessary.

- Keep the same muscular mass to stimulate osteogenesis; it is reported in the 2014 Female Athlete Triad Coalition Consensus Statement that the lean mass gained through resistance training may be beneficial in amenorrhea athletes;
- Decrease fat mass and aim for an optimal goal of 18% to 22% fat mass;
- Decrease calories, step by step (500 kcal) by consuming three fourths vegetables and one fourth starches;
- Aim to achieve the goal of a slow decrease of fat mass: 1 kg per 15 days, at best 18 days;
- For the junior female wrestlers, when the weight is high and the fat mass optimal, it is time to discuss and change to another weight class.

The second line is the nonpharmacological treatment. First, it is recommended to stop to disregard any warnings like a delay in training, most common injuries, stress fractures. Tiredness, dysmenorrhea should be responsible of a gap of performance. An endocrine gynecological examination is useful to explore the clinical causes. Second, energy status must be normalized through modifications of diet with the assistance of sport dietitian. Caring for female athletes is contingent on a multidisciplinary approach in consideration of the female wrestler, needs of training, level of performance, and health status.

The third line is the pharmacological treatment, in association with the previous treatment; treatment is composed of therapy with estrogen and progesterone, calcium-rich foods, and optimal vitamin D intake (De Souza et al., 2014).

In conclusion of this first part, it is important to provide valuable information to female wrestlers; amenorrhea is convenient but counterproductive in the long term, because of its associated risk of injuries and stress fractures. Concerning this issue, more multicenter studies are needed.
Pelvic Floor Dysfunction and Women’s Wrestling

Three out of seven female wrestlers reported urinary incontinence, especially after working the abdominal muscles, running, jumping, and weightlifting during the second period of training. Pelvic floor dysfunction involves muscular fatigue of the pelvic floor reported after 90 min of strenuous exercises, with a decrease of the mean maximal contraction of 20%. This muscular pelvic floor exhaustion is accompanied by anatomic and function changes, such as those described by Kruger in a study concerning 24 female athletes practicing sports with high-impact frequent intense training versus 22 controls (Kruger, 2007). The high-impact frequent intense training women had significant differences in the anatomy and function of the pelvic floor, such as a higher mean diameter of the pubovisceral muscle (0.96 cm vs. 0.70 cm, \( p < .01 \)), a greater bladder neck descent (22.7 mm vs. 15 mm, \( p = .03 \)), and a larger hiatal area (21.53 cm\(^2\) vs. 14.91 cm\(^2\), \( p = .013 \)), compared with the control group on Valsalva maneuver, in using 3/4D ultrasound pelvic floor imaging. These modifications are not found at rest.

What Is the Responsible Mechanism?

There is an imbalance between the resistance of the pelvic floor and the high abdominal pressure linked to abdominal contraction; this imbalance develops after a period of days especially in sports with high impact and sports with high abdominal tonus. The impact on the perineal function is increased with the years of training and should compromise the performance with the partial loss of abdominal pressure that is no longer contained by the weakness of the pelvic floor.

Caring for the Female Wrestler

Considered as linked to the intensive training and unavoidable, although perceived as a nuisance in competition, pelvic floor dysfunction is rarely a reason for consultation and thus therapy is delayed.

To decrease the prevalence of and promote the prevention of pelvic floor dysfunction, it is important to be informed about female athletes, trainers, and health professionals. It is important also to give some clear and understandable information about the role of pelvic floor, to promote the efficiency of the abdominal contraction without impact on the pelvic floor, and to learn how strengthen the pelvic floor during the career of high level female wrestlers.

CONCLUSION

Caring for the female wrestlers concerns several individuals including the elite athlete, the coach, the trainer, the sport physician, the gynecologist, the sports dietitian, and the sport physiologist. It is important to build the future of the female wrestler including the period after her career, by conducting more follow-up studies. It is also important to keep in mind that women’s physiology is a good factor of performance.

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REFERENCES