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Acute- Phase Radial Shock Wave Therapy (RSWT). New perspectives and applications in professional football players



Medical care and physiotherapy in professional football players, during the agonistic season, is a huge challenge for all the subjects involved. The majority of the players want to recover and be fit as soon as possible after an injury because they want to return to play in order to keep their place in the team. In the same way it is important that players return to full fitness as quickly as possible

even during a game, for example in the interval between the first and the second half. Acute - phase radial shock wave therapy (RSWT) is an interesting and innovative method to help achieve this goal. This article aims at being a sort of introduction to this new perspective. As a skilled and qualified anatomist, and also as a physician, I have cultivated for many years a scientific

interest in extracorporeal shock waves. It became my daily job when I worked as International Head of Business Development at EMS - Electro Medical Systems from 2008 to 2009. During my time at the EMS, I worked with clinicians and physiotherapists of professional football clubs on the development of new approaches for the use of RSWT in the treatment of players during the agonistic season, which should have diverged greatly from the normal practices of RSWT published in orthopedic literature, for example, for heel pain or tennis elbow. The key elements of acute-phase RSWT, in addition to daily treatments with RSWT, focus on the primary objective of improving the player's performance without resorting to doping and on the disappearance of pain without aiming at a speedy recovery, as well as on the use of RSWT within a few days, or even hours, of an injury. These new practices are being used with great success by top-level clubs in the United States, Brazil, Ecuador, England, Italy and Norway, and more recently in German Bundesliga.

N.B. The purpose of this practice is not the speedy recovery but the possibility of allowing the player to continue to play, ideally without any interruption. For this reason, acute-phase RSWT is applied both during the game, between the first and the second half, and immediately after the game, as well as during daily training sessions.

What follows does not describe any specific treatment, but rather some important aspects in order to create the conditions for the use of acute-phase RSWT in professional football players.

1) Trust

The first step is always a personal interview to overcome many justified doubts and some mistrusts. The most common questions are: "Does it really work?", "Isn't it doping in disguise?", "Does the treatment involve any unpredictable collateral risk for the player?", "How do I explain to the player that some RSWT treatments have to be uncomfortable in order to be effective?", "What kind of therapies might be effectively combined with RSWT treatment?" and "What are the limits of RSWT treatment?". The answers to all these questions are primarily based on our current knowledge of the molecular and cellular mechanisms of action of shock waves on the musculoskeletal system (see below).

2) Infrastructures

When we started using acute-phase RSWT on the players of the Italian Serie A team ACF Fiorentina, about a year ago, the question of the need for medical imaging was raised. My experiences at the Olympic Games in Athens 2004, Beijing 2008 and particularly London 2012 (see also Henne M, Schmitz C. Stoßwellentherapie – Mythos oder Evidenz? Medicalsportsnetwork,



Steffen Tröster, physiotherapist at the German Bundesliga club FSV Mainz 05, treating players with acute-phase RSWT.

Ausgabe 5.11; <http://www.medicalsportsnetwork.com/archive/110338/Stosswellentherapie.html>), taught me just how important a clear diagnosis is, especially for elite athletes, and that the greatest caution is needed especially with partial ruptures of tendons and ligaments. Therefore, in the case of ACF Fiorentina, almost every application of RSWT was preceded by an ultrasound scan. Of course, this does not replace the use of magnetic resonance imaging (MRI), of other imaging techniques or of further diagnostic procedures when appropriate.

3) Experience

Once confidence in the possibilities of acute-phase RSWT has been established, the most important aspects have been explained and a diagnostic ultrasound unit and shock wave therapy device has been installed, the team of physicians and physiotherapists need to gradually gain experience and reinforce their expertise. During this time, they are always available via email, phone, SMS or WhatsApp to give immediate answers to any questions, for example during the half-time. This is probably the most important phase when implementing acute-phase RSWT, and it is virtually impossible to generalize on it. Each club has developed its own medical/physiotherapy infrastructure, each clinician or physiotherapist has his/her own background, experience and therapeutic paths. As a consequence, any club using acute-phase RSWT will tend to create its own, highly individual approach.

4) Mechanisms of Action

Usually, many questions arise during the phase of skill acquisition and consolidation of experiences with regard to treatment method and duration. Straight answers rarely exist for these questions, due to the practical impossibility of a scientific validation of acute-phase

RSWT in accordance with the criteria of evidence-based medicine (see information box). Actually, many assumptions can be based on our current knowledge of molecular and cellular mechanisms of action of shock waves on the musculoskeletal system and I like to refer to that. Some courses organized by the Swiss DolorClast Academy (www.swissdolorclastacademy.com) are a reliable source for the elaboration and diffusion of current knowledge, and are open to all interested parties. All trainers at the Academy have received extensive training.

5) Establishing and developing concepts and notions

Certain conditions and injuries that are particularly common in footballers can be treated quickly and effectively with acute-phase RSWT, and even prevented altogether in some cases. It is extremely stimulating to see players, who should have interrupted their season due to chronic achillodynia or patellar tendinopathy, continue playing until the end of the season, thanks to acute-phase RSWT. The initial investment in acute-phase RSWT certainly pays off for the clubs, even in case they are forced to reduce their team by just one player, simply because of faster rehabilitation and of a better prevention of injuries.

Conclusion

Acute-phase RSWT opens up entirely new perspectives for the treatment of professional footballers, both for post-injury rehabilitation and for injury prevention, benefiting all stakeholders, i.e. players, managers and clubs. The therapeutic approach of acute-phase RSWT considerably differs from the “normal” treatment concepts with RSWT, which are primarily concerned with a speedy recovery, whereas the primary target of acute-phase RSWT is that of enhancing players’ performance and keeping them free from pain. The traditional treatment concepts with RSWT of the musculoskeletal system have been documented in a variety of scientific publications. If you want to pick a

selection of the best and most significant clinical studies conducted by a truly independent body (comparable to a consumer advice organisation) from this plethora of publications, it is worth having a look at the PEDro database of the Centre for Evidence Based Physiotherapy of the George Institute for Global Health at the University of Sydney (www.pedro.org.au). To date, the PEDro database contained a total of about 20 publications on RSWT. Fifteen of these studies were conducted with the Swiss DolorClast® device by Electro Medical Systems, based in Nyon, Switzerland. (A German-language compilation of the PEDro content is available from the author.) Many of these 15 publications come courtesy of the colleagues Prof. Jan-Dirk Rompe (Alzey), Prof. Ludger Gerdesmeyer (Kiel) and Prof. Markus Maier (Starnberg). The author was involved in two of these 15 studies. The publications have the following underlying treatment concepts in common: (i) a randomized and controlled approach, i.e. comparison to an alternative therapy or placebo treatment, (ii) the use of RSWT only after a waiting period of several weeks or months of unsuccessful conventional conservative therapy, (iii) the systematic use of imaging techniques such as ultrasounds and MRI before treatment with RSWT, (iv) applying RSWT three times at weekly intervals, (v) use of other types of treatment in addition to RSWT and (vi) resting of the patient during the treatment period.

In practice, such a treatment concept is out of the question for professional footballers during the ongoing season. Numerous discussions with clinicians and physiotherapists of professional football clubs have shown that conducting randomised and controlled studies for new treatment approaches is virtually impossible in professional football. This is also the reason why it is quite complex to add these new concepts to excellence databases such as PEDro. Moreover, it is rare to have only one single type of therapy used when treating injuries in football professionals.

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* A collection of contents from the PEDro database is available from the author