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Physiotherapy Management for Cases of Iliotibial Band Syndrome in Indonesian Para Athletics Athletes : Case Report

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Abstract

Iliotibial band syndrome (ITBS) is an overuse syndrome that commonly causes knee pain and is common in athletics. The prevalence of ITBS in runners ranges from 5%-14%, with a higher prevalence in women (16%-50%) than in men (50%-81%). ITBS can limit Indonesia's athletic performance due to pain on the side of the knee during running, walking and jumping. The aim of this study was to evaluate the physiotherapy management for ITBS cases in Indonesian para-athletics. This research is a descriptive case study involving one client with a participatory observation method. The physiotherapy intervention involved Shock Wave Therapy (SWT) and Static Stretching Exercise. The subject of the study was 22 year old national para athlete with height 182 cm, weight 70 kg, and BMI 21.1 in the ideal category. The patient came to the physiotherapy clinic of NPC Indonesia on 20 August 2023 with complaints of pain in the outer side of the right knee. Physical examination showed normal results except for pain examination using Numeric Rating Scale (NRS), where silent pain 2/10, tenderness 4/10, and motion pain 5/10 were found. The diagnosis of ITBS dextra was confirmed through specific examination. After six physiotherapy sessions with SWT and Static Stretching Exercise, there was a significant decrease in pain and an increase in functional activity in ITBS patients. Patients are advised to undergo physiotherapy regularly, do stretching exercises before and after activities, and compress with warm water if experiencing pain.

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INTRODUCTION

Disability is part of being human. Almost everyone will experience a temporary or permanent disability at some point in their lives. An estimated 1.3 billion people, approximately 16% of the global population, currently experience significant disability. This number is increasing in part due to population aging and the increasing prevalence of non-communicable diseases (WHO, 2022). While many forms of disability can lead to a sedentary lifestyle, there are still opportunities to increase physical activity through exercise, so that people with disabilities can experience the multiple positive health benefits of regular physical activity (Weiler et al., 2016). Exercise is a physical activity that can be done at any age to maintain health that provides many benefits to keep the body healthy and fit (Kisner, Carolyn; Colby, Lynn, 2017).

Physical activity or exercise keeps individuals healthy and provides social and economic benefits, including mental health and disease prevention for all, including people with disabilities (Novak & Goolsby, 2023). A sports injury is damage to the body during physical activity or exercise. It includes sudden injury and overuse syndrome resulting from repetitive exercise with monotonous movements (Setyaningrum, 2019). Sports injuries can be problematic for all athletes, but injured athletes with disabilities may find it more difficult to access health services and receive appropriate treatment. In general, sports injuries are caused by factors such as lack of warm-up, overuse of weights, improper training techniques, and also due to poor muscle, tendon, and ligament strength (Malfira & Hilmy, 2020). Sports injuries often cause a bodily response, including inflammation with symptoms of redness, swelling, heat, pain and decreased function (Setiawan, 2011). For example, in athletics, repetitive flexion-extension movements can trigger problems such as Iliotibial Band Syndrome (ITBS) especially if the athlete has abnormalities such as genu varus. ITBS causes inflammation and pain on the side of the knee and is common in athletics (Opara & Kozinc, 2023).

Iliotibial Band Syndrome (ITBS) is the second leading cause of pain in runners and there are a number of theories related to its etiology. Multiple theories exist for the etiology of ITBS related symptoms including anterior-posterior friction of the IT band on the lateral femoral condyle during knee flexion and extension activities, compression of a layer of fat near the IT band distal attachment, and inflammation of the IT band bursa (Charles & Rodgers, 2020). The incidence of ITBS in runners is 5%-14% and in the ITBS population, the prevalence in women is estimated to be between 16%-50% and in men between 50%-81% (Devi et al., 2022). ITBS can be experienced by athletes and others who frequently overtrain, especially if there are biomechanical abnormalities in the body that can have an adverse impact (Malfira & Hilmy, 2020). ITBS is caused by anatomical (intrinsic) factors such as genu varus, hip muscle weakness, and strain on the iliotibial band, as well as external factors such as overuse, downhill activities, and wearing worn-out shoes (Setyaningrum, 2019). If the injury is not addressed immediately, the effects can include muscle strain, pain, atrophy, limitation of motion, and loss of muscle function such as flexibility, strength, endurance, and balance (Mahasih & Fazrina, 2023). ITBS can limit the performance of Indonesian track and field athletes as it causes pain on the side of the knee during activities such as running, walking and jumping, which disappears at rest. If left untreated, it can hamper

sports and daily activities (Malfira & Hilmy, 2020). Patients with ITBS are recommended to take rest as the first step to recover from pain. Thus, refraining from the activities which incite the pain followed by a gradual return is suggested to avoid recurrence of symptoms. Addition of physical therapy to treatments is essential to treat ITBS (McKay et al., 2020).

In this ITBS condition, physiotherapists play a role in reducing pain and increasing functionality. To overcome it, the physiotherapy modality chosen by the author is Shock Wave Therapy (SWT), static stretching exercise. Shock wave therapy is a medical procedure that uses high-energy shock waves to reduce pain in various musculoskeletal conditions. Shock wave therapy produces shock waves that are directed to the area of pain. These shock waves can stimulate tissue repair, increase blood flow, and reduce inflammation, which in turn can reduce pain and speed up the healing process. This method is often used as a non-invasive alternative to reduce chronic pain in several musculoskeletal conditions (Al-Abbad et al., 2020).

Static stretching exercise is one of the stretching exercises in which a person takes a certain position and maintains it for a few seconds or more without repetitive motion, usually used as part of a warm-up and cool-down routine to improve range of motion (ROM) ability and potentially prevent injury (Takeuchi & Nakamura, 2020). Based on research (Maghroori et al., 2021) with the title "Shockwave Therapy Versus Dry Needling for the Management of Iliotibial Band Syndrome: A Randomized Clinical Trial", found a significant effect in reducing pain for pain in cases of iliotibial band syndrome. According to (Muragod & Nitsure, 2014) in their publication, static stretching exercise can significantly improve iliotibial band flexibility. And in research (Weckström & Söderström, 2016) it is said that SWT and Manual Therapy were equally effective in reducing pain in subjects with ITBS.

The purpose of this case report journal is to educate athletes and the public about iliotibial band syndrome as a common health problem in athletes. This knowledge is expected to help in detecting early symptoms, preventing them, and improving more effective physiotherapy methods. This is expected to improve healthcare services, both for athletes and the general public who experience similar problems.

METHODS

This type of research is a descriptive case study using observation and participation methods to evaluate physiotherapy management of iliotibial band syndrome (ITBS) cases in Indonesian para-athletic athletes.

Participants

The subject in this study was a man An. F is a national para-athlete who is 22 years old. NPC Indonesia Clinic is the place of this research. Jl. Sugiyopranoto No.20, Kp. Baru, Kec. Ps. Kliwon, Surakarta City, Central Java.

Sampling Procedures

Data collection methods by means of subjective examination, objective examination, motion examination, cognitive ability examination, personal and interpersonal skills, functional examination and activity environment, and specific examination in 1 sample of iliotibial band syndrome cases in Indonesian Para athletics athletes.

Materials and Apparatus

Measurement, examination and intervention tests used in data collection techniques include (i) BMI measurement using body weight (scales) and height (meter). (ii) general examination; blood pressure & pulse (electric tension meter), body temperature (thermometer), breathing pattern (inspection). (iii) physical examination; joint motion scope (goniometer), muscle mass (midline), muscle strength (mmt), pain (VAS). (iv) specific examination; ober's test, anterior - posterior drawer test, varus - valgus test, renne's test. (v) functional examination using the Lower Extremity Functional Scale (LEFS). (vi) modality intervention using Shockwave Therapy.

Procedures

The procedures used in this study are as follows: (i) researchers first measured and examined the subjects. (ii) researchers classified and categorized the data. (iii) testing was carried out at the NPC Indonesia Clinic. Sugiyopranoto Street No.20, Kp. Baru, Kec. Ps. Kliwon, Surakarta City, Central Java.

Design or Data Analysis

Data analysis techniques using interviews, observations, and case studies to obtain conclusions from the research.

RESULT

1. Inspection Result

A 22-year-old national para athlete with a height of 182 cm, weight of 70 kg, and BMI of 21.1 complained of right knee pain on the outer side. This pain increased after the championship at the ASEAN Para Games Cambodia 2023, especially during running and intensive training, but decreased when resting. This pain had interfered with training and competition, and the patient had a history of rigorous and regular training. The patient came to the physiotherapy clinic of NPC Indonesia on 20 August 2023, daily activities as a male para-athlete with T46 classification of 200m, 400m, and long jump race numbers forced the patient to continue training on the field, hindering the recovery process that should have been.

On general examination the patient was conscious, cooperative, and able to communicate with the physiotherapist in a relaxed sitting position. Blood pressure 120/80 mmHg, pulse 85x/min, normal breathing 20x/min, and temperature 36˚C. The physical examination results were normal, except for the pain examination (VAS: silent 2/10, press 4/10, motion 5/10). The patient did not bring the results of the supporting examination when he came to the physiotherapy clinic. In enforcing the diagnosis, the physiotherapist used the Lower Extremity Functional Scale (LEFS) and found a difference of 10 points with a score of 86.25%, indicating functional limitation in the Lower Extremity and specific examination of the knee region resulted positive on Ober's test and Renne's test, indicating iliotibial band syndrome dextra injury. Physiotherapy diagnosis includes Body Structure, Body Function, Activity Participation, and Environmental Factor which will affect patient intervention. Interventions were tailored to short-term (reducing pain) and long-term (improving functional ability) physiotherapy goals. The patient received SWT and Static Stretching Exercise for 6 sessions in 2 weeks, each session was about 1 hour, considering his condition.

Table 1. Inspection Results

Pain Screening (VAS)	
VAS	**Results**
Silent pain	2
Pressure pain	4
Movement pain	5

Interpretation: mild pain (1-4), moderate pain (5-6), severe pain (7-10) (Delgado et al., 2018).

Tabel 2. Screening Lower Extremity Functional Scale (LEFS)

No	Activities	Poin
1	Any of your usual work, housework or school activities.	4
2	Your usual hobbies, recreational or sporting activities.	3
3	Getting into or out of the bath.	4
4	Walking between rooms.	4
5	Putting on your shoes or socks.	4
6	Squatting.	3
7	Lifting an object, like a bag of groceries from the floor.	4
8	Performing light activities around your home.	4
9	Performing heavy activities around your home.	3
10	Getting into or out of a car.	4
11	Walking 2 blocks.	4
12	Walking a mile.	3
13	Going up or down 10 stairs (about 1 flight of stairs).	3
14	Standing for 1 hour.	3
15	Sitting for 1 hour.	3
16	Running on even ground.	4
17	Running on uneven ground.	3
18	Making sharp turns while running fast.	2
19	Hopping.	3
20	Rolling over in bed.	4
	Total Score:	69 :80 x 100 = 86,25%
Total Column (not point 4)		10

Description: Extreme difficulty or unable to perform the activity (0), Quite a lot of difficulty (1), Moderate difficulty (2), Little difficulty (3), No difficulty (4).

Interpretation:

The lower the score the greater the disability, The minimal detectable change is 9 scale points, The minimal clinically important difference is 9 scale points, % of maximal function = (LEFS score) / 80 * 100 (Binkley JM, Stratford PW, Lott SA, 2011).

Tabel 3. Specific Examination and Differential Diagnosis

Test	Results
Ober's test	+
Anterior – posterior drawer test	-
Hypermobility Varus Valgus test	-
Renne's test	+

Interpretation : Positive results from Ober's and Renne's tests indicate ITB tightness and pain at the lateral epicondyle is a positive sign of ITBS injury (Kendall, McCreary, 2019).

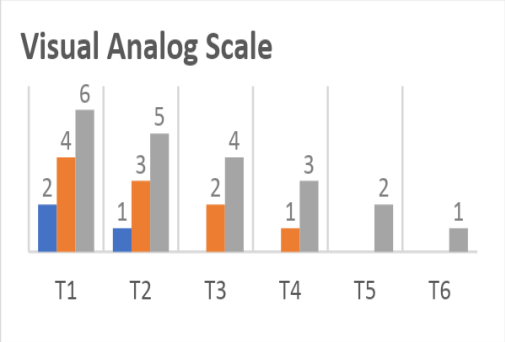
Tabel 4. Intervensi Fisioterapi

Meeting	1,2,3,4,5,6
Intervention	1. Shock Wave Therapy (SWT) 2. static stretching exercise (Lower Extremity)
Objective	. Controlling pain . Pain reduction, relaxation, increased muscle flexibility, & functional
Dosage	. F : 3x/week I: according to patient tolerance T : 15 minutes . T : SWT F : 3x/week I : 10 reps 3 sets T : 8s/exc T : Exercise

2. Case Study Results

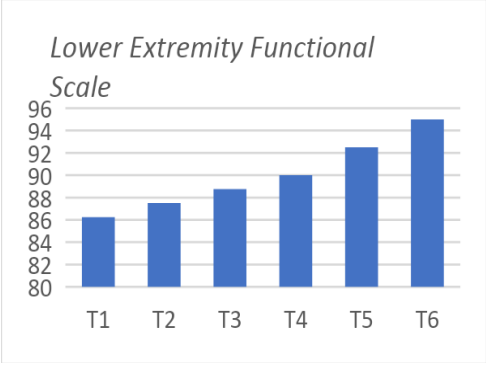
After 6 intervention meetings in 2 weeks, the patient was included in the evaluation. In general, the patient showed improvement and no additional

complaints. The evaluation involved the use of Visual Analogue Scale (VAS) for pain and Lower Extremity Functional Scale (LEFS) for activity function. The results were evaluated on several dates, firstly 4 September 2023 (T1), 6 September 2023 (T2), 8 September 2023 (T3), 11 September 2023 (T4), 13 September 2023 (T5), and 15 September 2023 (T6). Here are the results:



Graph 1. Results of VAS (Pain) Examination

Graph 1 shows a gradual decrease in pain after 6 physiotherapy sessions. Silent pain decreased from T1=2 to T6=0, tenderness from T1=4 to T6=0, and motion pain from T1=6 to T5=1. Pain evaluation was done every meeting to observe the effect of SWT and Static Stretching Exercise.



Graph 2. Functional Activity with Lower Extremity Functional Scale (LEFS)

Graph 2 shows an increase in functional activity after 6 physiotherapy sessions. The LEFS score increased from T1=86.26% to T6=95%.

DISCUSSION

As illustrated by the case presentation above, patients with ITBS usually present with complaints of pain because Iliotibial Band Syndrome (ITBS) is considered one of the overuse injuries that often causes inflammation and pain in the lower extremities, it affects 7-14% of the runner population and can interfere with performance and body function (Shamus & Shamus, 2015). In overcoming ITBS, physiotherapists play a role in reducing pain and increasing functionality, the physiotherapy modality chosen by the author is by using Shock Wave Therapy (SWT) and static stretching exercise. In graph 1 the results of the vas (pain) examination show a gradual decrease in pain. This statement is in line with the research of (Maghroori et al., 2021) on shockwave therapy has a significant effect in reducing pain in cases of iliotibial band syndrome, this is due to the swt mechanism which leads to improved function and pain relief at the site of injury by increasing local microcirculation, increasing metabolic activity, and clearing inflammatory agents responsible for pain at the site of injury (Maghroori et al., 2021). Shock wave therapy (swt) is a non-invasive treatment option that directs shock waves to the affected area of the body, relieving pain and enhancing the process of tissue regeneration (Erika, 2019).

In Graph 2 Functional Activity with Lower Extremity Functional Scale (LEFS) shows an increase in functional activity, this can occur due to reduced pain. This makes it easy and free for patients to do activities independently and have no difficulty doing daily activities.

This statement is in line with (Yin et al., 2021) research on the provision of static stretching after exercise effectively prevents knee pain, maintains iliotibial band flexibility, iliotibial band function, and stabilizes the knee joint, and reduces pain related to iliotibial band disease. Static Stretching can increase the range of motion and flexibility of soft tissues such as muscles and ligaments, which is beneficial for improving sports performance, managing post-exercise pain, and reducing the risk of injury (Leigh-Ann Bramble, 2021). Flexibility is the ability to move freely within the maximum space of motion (Prabowo & Syahlaa, 2023). Research by(Muragod & Nitsure, 2014) showed that static stretching exercise significantly improved iliotibial band flexibility.

CONCLUSION

Based on the results of studies that have been conducted, SWT and static Stretching exercises are effective in reducing pain and improving functional abilities in patients with iliotibial band syndrome cases.

ACKNOWLEDGEMENT

1. Suggestions for Patients:
    a. Adhere to the therapy plan that has been suggested by the physiotherapist regularly and disciplined.
    b. If you experience any discomfort or have any questions, communicate with your physiotherapist immediately.
    c. Do not hesitate to talk to your physiotherapist about changes in your condition during therapy.
2. Advice for Physiotherapists:
    a. Keep your knowledge updated on the latest developments in physiotherapy, particularly in the use of the latest technology such as SWT.
    b. Always communicate with patients about the progress of their therapy, and provide clear explanations about the benefits of each type of intervention.
    c. Consider utilizing the latest technology and aids available to improve the effectiveness of therapy.
    d. Establish a good relationship with patients, provide emotional support, and encourage them to undergo therapy consistently.

With mutual cooperation between patients and physiotherapists, as well as the application of the latest technology, it is hoped that physiotherapy services can continue to be improved and provide maximum benefits for patients with iliotibial band syndrome and other conditions.

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