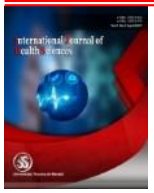

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The Role of Physical Rehabilitation in Thoracic Fracture Patients with Comorbid Major Depressive Episodes

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Abstract

Isolated rib fractures are a non-trivial trauma burden associated with functional impairment and chronic pain. Distraction fractures of the VII-IX thoracic spine are one of the injuries that occur in the middle of the thoracic spine. Some common symptoms that occur are sharp or dull pain in the middle back between the shoulder blades and waist, limited movement, especially stiffness when bending or twisting the body, and respiratory distress. From the case of an 18-year-old male patient, a student, who came to the medical rehabilitation polyclinic in a wheelchair with his mother. The position of both legs is bent. His current physical condition is due to an accident. The patient experienced severe depression with symptoms of feeling sad, feeling weak, even though he had eaten enough, and losing interest in things that made the patient happy before. Physical Rehabilitation Therapy includes mobility exercise, occupational therapy 1 time a week: stimulation and facilitation of hand function, Activities of Daily Living (ADL) gradually. Combination of therapy with Psychiatry in the form of pharmacotherapy and psychotherapy. Multidisciplinary treatment, especially structured physical rehabilitation programs, psychiatry, and other fields, can improve symptoms of pain, and other symptoms, and symptoms of depression. This will improve the quality of life in patients with thoracic fractures accompanied by functional impairment and immobilization.

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Contents

1 Introduction

Distraction fractures in the VII-IX thoracic spine are one of the injuries that occur in the middle of the thoracic spine. Some common symptoms that occur are sharp or dull pain in the middle back between the shoulder blades and waist, limited movement, especially stiffness when bending or twisting the body, and weakness or numbness in the lower extremities. Other symptoms that appear are difficulty breathing due to damage to the spinal nerves because it affects the respiratory muscles. Deformity or swelling, and neurological symptoms such as tingling, loss of control of bowel or bladder function. Because these symptoms require early and appropriate medical rehabilitation team services. From a study, it was stated that long-term lung function and quality of life should be reassessed to values considered normal, subjective thoracic complaints, such as pain and dyspnea, still often appear after rib fractures. There was no effect of the severity of chest wall injury or treatment modality on long-term outcomes shown (Prins et al., 2021). Isolated rib fractures are a non-trivial trauma burden that is associated with impaired function and chronic pain even 6 to 12 months after injury (Heindel et al., 2022).

Early proactive rehabilitation can be beneficial for patients who have fractures due to motor vehicle accidents. This is obtained from a study that assessed a series of measurements including pain, psychological assessment, return to work and return to driving (Brooke et al., 2014). In this case, the physical rehabilitation team performed physiotherapy which plays a role in maintaining and improving physical capacity and functional ability. Physiotherapy is a form of health service from the field of physical medicine and rehabilitation aimed at individuals and/or groups to develop, maintain and restore movement and body function throughout the life cycle using manual handling, increased movement, equipment (physical, electro-therapeutic and mechanical), functional training, and communication. In cases like this, physiotherapy aims to increase upper limb muscle strength, prevent respiratory disorders, maintain joint mobility so that there is no limitation of joint range of motion and contractures, improve bladder and bowel function and increase functional activity and prevent increased decubitus (Firdasari et al., 2021). Mobilization, functional exercises, deep breathing exercises, and active coughing are used to optimize the patient's respiratory and musculoskeletal function. Some physiotherapists educate patients on the use of pain management strategies to reduce discomfort from rib fractures, surgical sites, and intercostal drainage tubes. Physiotherapy management of patients with blunt or penetrating trauma to the trunk during hospitalization and after discharge is an area of clinical practice rich in high-quality research related to service delivery, cost analysis, and interventions used (Van Aswegen, 2020). Young patients with thoracolumbar fractures are vulnerable to anxiety and depression. Patient anxiety and depression are closely related to social stress, which reduces the life stress of young patients with thoracolumbar fractures, increases social support, and improves the psychology of anxiety and depression, which affects patient recovery (Wang et al., 2025).

This literature review aims to evaluate the scope and effectiveness of rehabilitation interventions and exercise programs that can improve quality of life and improve symptoms in thorax fracture patients with comorbid major depressive episodes without psychotic symptoms.

2 Materials and Methods

The research method used in this study is a case report with a literature study using secondary data sources from various articles in national, international journals, and textbooks. The author uses Pubmed and Google Scholar with keyword searches, "Intervention", "Rehabilitation", Physical, Fracture", and "Depression". The literature obtained is then analyzed systematically. Literature collection is carried out by considering the inclusion criteria in the form of literature published no later than 2018.

Case Report

An 18-year-old male patient, a student, came to the medical rehabilitation polyclinic in a wheelchair with his mother, looking age-appropriate. The position of both legs is bent. The patient said that his current physical condition occurred due to a single accident 8-9 months ago, when he was riding a motorbike even though he was using a safety harness. Since then, he has not been able to walk normally. He knows very well what his condition is and what the prognosis is like. Since then, he has felt sad until now, feels weak even though he has eaten enough and has lost interest in things that made him happy before. He also said that his mind is often not focused on doing light daily work, his sleep is disturbed, he has difficulty falling asleep, and often wakes up. He feels that his future is bleak, there is nothing else that can be done. In addition, the patient also feels useless. He cannot do activities like before the accident because he cannot walk. Sometimes he thinks about dying, but does not plan to hurt himself. His appetite is also reduced, he does not enjoy food. He does not hear voices and sees shadows. He has no history of previous serious illnesses, uses glasses minus -8 and minus -9. In addition, previously his physical condition was good. He had never sought psychiatric treatment because of his sad condition. He did not smoke, rarely drank coffee, and did not use illegal drugs.

Before he was sick, the patient was a cheerful person, liked to gather and chat with friends. The patient's mother said that she was first brought to the Emergency Room of Prof. Ngoerah Hospital with a referral. He often looked sad at home, often said he wanted to die, asked the family to forgive him. Sometimes when sadness came, the patient cried while screaming. His family at home understood the patient's condition and left him alone so that he calmed down on his own. Sadness began to appear since the patient was informed about his condition by the doctor who was treating him at that time. The patient became very quiet, sad when reading school groups. He also said that he did not like being visited by his school friends and said it was better to break off relations with his friends. When he was little, the patient accidentally drank caustic soda and since then has often been back and forth to the hospital.

Currently, he cannot do activities like before, he does a lot of activities in bed, can lie down, but is more comfortable if he lies down with both legs bent towards his chest. If straightened, the patient's legs and body will tremble and he often complains of dizziness. He routinely consumes medication given by the hospital for his illness.

The patient's habit of drinking 1-2 cups of coffee per day, does not smoke, does not drink alcohol, and does not use drugs. Prenatal and Perinatal History, normal birth assisted by a midwife, and full-term birth. His mother was healthy during pregnancy, and the child was expected by the family. Early Childhood History (age 0-3 years), the patient received breast milk, the patient's growth and development were by children of his age. Middle Childhood History (age 3-11 years), can learn and socialize well with his friends. Adult history, at the age of 17, he had an accident that made him unable to walk until now, the patient does not want to socialize with his friends anymore. He denies hearing voices or seeing anything without a clear source. Because of decreased appetite, the patient eats little by little. Sleep is also disturbed, due to shortness of breath. He often wakes up and has difficulty falling back asleep. He tends to be calm.

Previous medical history in the patient is Corrosion of the esophagus to the stomach, due to drinking caustic soda at the age of 4 years (2012), history of SCI ASIA A + Fr. Th7-Th9 distraction due to an accident in September 2023, Total atelectasis of the lung D ec Trauma (September 2023), Right Humerus Middle Third Fracture (September 2023). There is no history of allergies, a history of other systemic diseases is denied, and a history of drug and food allergies is denied.

On examination of vital signs found BP: 115/76 mmHg, pulse 78x/minute, RR: 18 x/minute, temperature 36.5 0C. Weight: 55 kg, Height: 160 cm, Nutritional Status: Good. General status examination, anemic eyes -/-,

icteric -/-, isochoric pupils +/+, ENT within normal limits, thorax: cor: BJ I/II regular, murmur -, gallop -, pulmo: vesicular +/+, rhonchi +/+, wheezing -/-, abdomen: normal bowel sounds, tenderness -, liver/spleen not palpable, extremities no edema. In neurological status, GCS: E4V5M6, no meningeal sign ROM AGA D/S: full/full, ROM AGB D/S: limited pain, MMT C5-T1 D/S: 55555/55555, MMT L2-S1 D/S: 11111/11111, Sensory deficit as high as T6 and below.

On mental status examination, general impression: Appearance is normal according to illness, appears to be using a wheelchair, face looks uncomfortable, verbal and visual contact is lacking, less cooperative, consciousness: clear, orientation and memory are good, mood: dysphoric, sad, affect: narrowed, appropriateness: appropriate, thought process: form of thought: logical realistic, thought flow: coherent, thought content: preoccupation with complaints, suicidal ideation, perception: no hallucinations and illusions, instinctual drive: mixed type insomnia is present, hypobulia is present, raptus is absent, psychomotor: calm, good judgment, insight level 4. Psychiatric supporting examination with Beck Depression Inventory: 56 (severe depression) (Richards, 2011).

From the results of the examination, the patient was diagnosed with Spinal Cord Injury (SCI) ASIA A (severe motor and sensory disorders), Distraction Fr CV Th7, Th8, Th9 post Laminectomy Decompression Th7-8 + Stabilization Fusion Th 6-Th10 and Evacuation EDH, Disturbance Mobilization and ambulation function and long-term immobilization accompanied by comorbidity with Major Depressive Episode disorder without psychotic symptoms (F32.2). Current Global Assessment Functional (GAF) 20-11 with symptoms and severe disability of self-injury attempts. GAF in the last 1 year: 50-41, severe symptoms and disability, functioning poorly. The patient was treated by Physical Medicine and Rehabilitation with Physiotherapy 2 times a week, evaluated after 5 therapies, IR lower extremities, ROM exercise: Gentle stretching hip exercise, adductor, genu D/S Core exercise Bed mobility exercise, Occupational Therapy 1x in 1 week: stimulation and facilitation of hand function- Activities of Daily Living (ADL) gradually. The patient was also given treatment from Psychiatry. Pharmacological Therapy was given: Fluoxetine tablets 10 milligrams every 24 hours intraorally (night), Diazepam tablets 2 milligrams every 24 hours intraorally (night) if unable to sleep. Non-pharmacological therapy includes relaxation therapy, supportive psychotherapy to overcome patient sadness and family psychoeducation.

3 Results and Discussions

The problem in this case is that a change in mood is currently found, namely depression as a result of changes in the patient's health condition from healthy to sick, which causes the patient to be unable to carry out activities as before. This disorder is a direct consequence of changes in the patient's health situation that occurred in less than 6 months. The patient also experienced mixed insomnia because it was difficult to move both lower extremities. This can be overcome with physiotherapy, which is expected to help strengthen the muscles so that the patient can be more comfortable and better. In addition, the use of benzodiazepine drugs can also help overcome insomnia experienced by the patient. The diagnosis of the disease is made based on anamnesis and physical examination, internal examination, mental status and supporting examinations and based on the Guidelines for the Classification of Mental Disorder Diagnosis and a diagnosis was obtained as a Severe Depressive Episode without psychotic symptoms (F32.3) Intervention is a step between diagnosis and patient acceptance of treatment.

Patients need some discussion before they can accept the diagnosis and participate in treatment. Interventions provided with the FRAMES concept (Syamsulhadi & Septiawan, 2016): Feedback on the patient's risk or impairment: Because the severity of the disease caused psychological disorders in the patient; Responsibility for change belongs to the patient, In order for the disease to be handled optimally, good cooperation is needed between the patient, family and doctor; Advice to change should be specific and non-ambiguous: Currently, the patient should follow the therapy and advice that has been determined by the treating doctors; Menu of alternative strategies: To overcome the psychological disorders that are currently occurring due to the disease, I will provide psychotherapy and relaxation therapy so that they can be calmer; Empathetic rather than confrontational counseling style: I am happy to help, hopefully I can feel more comfortable; Self Efficacy: I am sure the patient and his family will follow all treatment recommendations. Rib fractures can be painful, but also frightening (Kanis et al., 2009). Rehabilitation interventions that promote

pain management, normalize trauma, and restore physical activity can improve recovery. Implications for Rehabilitation are that patients identify challenges with rehabilitation throughout the recovery journey, and their rehabilitation needs evolve. People find it difficult to regain their pre-injury fitness even after their fracture has healed and the pain has subsided. The belief that nothing can be done to help a rib fracture contributes to people lowering their expectations of achieving a full recovery and developing a sense of "surviving." Rehabilitation and patient education after traumatic multiple rib fractures should focus on improving pain management, respiratory fitness, and emotional well-being (Claydon et al., 2018).

Early rehabilitation can be a viable alternative to maintain the Barthel Index in patients with acute vertebral compression fractures (Kobata et al., 2021). Other studies have also mentioned that a special rehabilitation care program added to conservative care during treatment can improve the functional ability and quality of life of patients after rib fractures at hospital discharge and at six-month follow-up (Granados Santiago et al, 2021).

Therapy provided by Medical Rehabilitation is a very important therapy to improve the general condition of the patient so that complaints can be reduced where the patient must obediently follow the advice of the treating doctors. Therapy from the field of Psychiatry is the administration of pharmacology in the form of Selective Serotonin Reuptake Inhibitors (SSRI) namely fluoxetine 10 milligrams every 24 hours intraorally and the administration of benzodiazepine Clobazam if anxiety and insomnia appear. Non-pharmacological therapy is supportive psychotherapy, sleep hygiene, and relaxation therapy. The purpose of providing relaxation therapy is useful so that patients can reduce pain levels. The role of the psychiatrist in this case is to bridge the patient's complaints/problems to other disciplines to get treatment that can help reduce patient suffering. Teaching relaxation therapy to patients is done so that the pain felt can be diverted, providing supportive psychotherapy so that patients do not feel discouraged by providing ventilation, suggestion, reassurance, and persuasion. Sleep hygiene is given to deal with the patient's difficulty sleeping (Cicerone et al., 2011).

A multidisciplinary clinical pathway is considered an important management strategy in patients who have sustained multiple rib fractures and have therefore been identified as "at risk" based on established parameters. Physiotherapy interventions are an integral component of this multidisciplinary clinical pathway and interventions may include the use of incentive spirometers, mobilization and range of motion, and strengthening exercises. Early mobilization within this clinical pathway is a key factor in preventing respiratory complications such as pneumonia, respiratory failure, and Adult Respiratory Distress Syndrome (ARDS). Physical rehabilitation interventions are one component of the multidisciplinary clinical pathway and adequate pain services, involvement of the respiratory team, dieticians, and nurse practitioners may be involved in this management pathway. For this management pathway to be successful, early aggressive pain control has been identified as an essential component of care (Weinberg & Aswegen, 2018).

4 Conclusion

Evidence suggests that multidisciplinary care, particularly structured physical rehabilitation programs, psychiatry, and other disciplines, can improve pain symptoms, and other symptoms, and depressive symptoms. This will improve the quality of life in patients with thoracic fractures with impaired function and immobility.

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