International Journal of Clinical Science and Medical Research

ISSN(print): 2770-5803, ISSN(online): 2770-582X

Volume 02 Issue 05 May 2022

DOI: https://doi.org/10.55677/IJCSMR/V2I5-01/2022, Impact Factor: 5.868

Page No : 25-27

Physiotherapy Intervention for Soft tissue Contracture and Joint Stiffness followed by BURN: A Case Report

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ABSTRACT

Burns or thermal injuries are life-threatening conditions that lead to death. Flame burn is more common and has an increasing mortality rate. Worldwide, burn injuries are ranked fourth in leading causes of death. The aim of the study is to represent the case report of burn, complications of burn, and the role of physiotherapy for soft tissue contracture and joint stiffness following burn in different stages. In this study, we found that a teenage girl was affected by a burn from the kitchen. She came for physiotherapy treatment at a sub-acute stage. She has scars in different areas and decreased ROM in different joints. Initially, we diagnosed her as having soft tissue contracture and joint stiffness from a physiotherapy point of view. We managed her with proper education of hygiene, respiratory physiotherapy, friction massage, stretching exercises, ROM exercises, and positioning of extremities. Recent literature also suggests that positioning is very important to preventing scars. Also, aerobic exercise and resistance training have been applied in chronic burn management. There is a lack of scope for physiotherapists in the acute stage of burn management. So, a serious complication developed in the post-burn. Therefore, physiotherapy intervention is effective from the beginning of burn injury to rehabilitation.

Published Online: 02 May 2022

KEYWORDS:

Burn, Physiotherapy, Case report, Conservative management

BACKGROUND

Burns or thermal injuries are common occurrences that can affect all age groups and lead to a mortality rate. Actually, burns or thermal injury are accidents that may happen due to a lack of care. In a study, it was estimated that burns ranked fourth among all injuries.[1] There are several types of burns according to the area of involvement: 1st degree, 2nd degree, 3rd degree, and 4th degree burns. Burns may occur due to thermal or non-thermal sources. A study conducted in Bangladesh found that 89% of the deaths were caused by flame burns and that cooking fires, heating fires, and fires from kerosene lamps were the major sources of flames.

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Cite this Article: Parvin Akter, Md Nazmul Hassan, Dr. Mohammad Anwar Hossain (2022). Physiotherapy Intervention for Soft tissue Contracture and Joint Stiffness followed by BURN: A Case Report. International Journal of Clinical Science and Medical Research, 2(5), 25-27

It is also suggested that 90% of burns occur at home in the kitchen while preparing food. The majority of burn deaths occur during the winter season.[2] All age groups have a risk of developing burns. A recent study in Bangladesh suggested that more than 50% of injuries were seen in adults, 25 to 64 years of age.[3] Children 1 to 4 years of age were four times more likely to sustain burn injuries as compared to infants, and the causes of childhood burns were traditional kerosene lamps (kupi bati) and kitchens in open places without doors.[4] Females are more likely to be affected than males. Though the mortality and morbidity rates have decreased in the past decade, in Bangladesh, the mortality and morbidity rates were 2 deaths and 528 injuries per 100,000 population.[2] Worldwide, 90% of deaths due to burns occur in low and middle income countries (LMIC). There are numerous serious complications that can arise as a result of a burn

injury. Oedema and hypertrophic scars develop after burn injuries.

Physiotherapy intervention is useful in the management of burns with other Multi-Disciplinary Team members. From the acute stage of burns to complete rehabilitation, the role of physiotherapy is indispensable. A physiotherapist helps to prevent complications, manages acute respiratory complications, and ultimately saves lives.

Therefore, in this study, we report a case of burn and discuss the outcome of physiotherapy intervention for different complications. So, the aim of the study is to represent the complications of burns and the role of physiotherapy in different stages.

CASE REPORT

X, a 14-year-old young girl, came to our centre for physiotherapy management after a burn. She got into an accident with a gas stove at home and was admitted to the burn unit of Dhaka Medical College Hospital. Altogether, 19% of total body surface area (TBSA) was burned by flame (2nd-3rd degrees). The affected regions were the anterior neck with chin, upper right antero-superior trunk, whole chest up to umbilical level, and right upper extremities. After the initial dressing, the patient was taken to the intensive care unit (ICU) and fully monitored with central venous, arterial, and urinary catheterization. One month later, reconstructive surgery had been done. She has been taking a high-protein-enriched diet every day. When the patient's medical condition became stable, the doctor referred her to a physiotherapist for further management as well as rehabilitation. After that, she came to the rehabilitation centre for physiotherapy treatment. She came to the physiotherapy department after screening by a multi-disciplinary team (MDT). From subjective assessment, we knew that her complaint was neck and shoulder girdle pain. She was unable to move her upper limbs, neck, or chest. She was feeling some breathing discomfort also.

I finished her objective assessment at the end of the subjective information. During assessment, I found that her chest skin color had changed and there was no skin in her right arm. A blister was present around the anterior of the neck. Severe tenderness is found in the chest and neck during palpation. They also found a decreased range of motion in different joints. In the shoulder joint, there was a major loss of active and passive ROM in all directions on both sides (only 60 degrees of flexion and abduction were found). No movement was found in the cervical spine. There was a fixed deformity found in the cervical spine, like a protruding neck. In the thoracic spine examination, I found that her chest opening capacity had decreased and also her thoracic movement had decreased (no active movement of thoracic extension, side rotation). Her 'end feel' in her shoulder was painful.

INTERVENTIONS

As part of the intervention, I first taught her about her skin care, hygiene, problems, and so on. Then, I advised her to do breathing relaxation exercises (5 reps for 1 set). 5 I also added gentle stretching exercise of shoulder.[6] Then I gave her some home advice. In the second session, I found that her breathing pattern had improved. On that day, I gave her previous treatment with chest opening exercises (10 repetitions for 1 set). I also started a gentle friction message for scar management.[7] ROM exercises for the upper limb and neck also started to improve the ROM.[8] Maintain stretching on the contracted area for at least 30 minutes twice a week. After four weeks of treatment, her pain went down, she was able to breathe better, and she had a little more range of motion in her cervical spine. Also improved shoulder ROM (5 degrees from the start).

DISCUSSION

Physiotherapy intervention is effective for burn patients after burn assessment. According to the Australian and New Zealand Burn Association, 2007, a guideline was established for all health professionals. Physiotherapists aim to prevent respiratory complications, control oedema, maintain joint ROM, maintain muscle strength and prevent excessive scarring. I have given intervention to minimize oedema, improve joint ROM which was lost due to stiffness, and applied intervention to prevent excessive scarring. This patient came in a sub-acute stage, and the study suggested that in a sub-acute stage there may be a chance of scarring. A study suggested that mobilization of joints, ROM exercise, and massage are helpful to overcome this condition.[7] She has breathing problems and also has pain in different areas. A study was found in the Burn Journal and they focused on how breathing relaxation exercises are effective in minimizing procedural pain and anxiety.[5] In different stages, the scar message technique is different from that mentioned in table 1. Pressure garment therapy (PGT) and silicone are another technique which may be helpful to minimize scars. Physical therapy exercise is more effective than PGT.[9] A study found that 20–25 minutes of massage therapy once daily for 5 days increased the ROM of burnt-affected joints.[8] Aerobic exercise and resisted training are used as physiotherapy interventions in the chronic stage of post burn.

A systematic review of aerobic exercise for physical fitness assessment found that a 12-week fitness program significantly improved the fitness of children after burns, and aerobic exercise is effective in the rehabilitation of chronic burns.[6]

CONCLUSION

Any injury can lead to serious complications, but death from burns is more pathetic. Burns may happen at any age. Children and females are the most vulnerable groups. But immediate intervention, along with MDT management, can

save a life. Physiotherapy exercise should be administered at an acute stage so that serious complications can be prevented. Recent evidence suggests that positioning, scar massage, aerobic exercise, and resistance training are effective physiotherapy interventions for burn management.

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