

Case Report: Burns Secondary to Infrared Therapy in a Six-year Old HBSS patient

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Abstract

A six-year-old male HbSS patient was referred to the physiotherapy unit of the university teaching hospital, Ado-Ekiti. The boy had earlier presented at his regular clinic during a prolonged vaso-occlusive crisis involving both lower limbs. He was treated with intramuscular (gluteal) injections alongside other management. He later developed a left foot-drop. After a few sessions of heat (infrared) therapy, the plantar surfaces of all the left toes became scalded and sore. The other foot on which no physiotherapy was applied was normal. Case reports of similar incidents in the literature were reviewed. Possible explanations of the phenomenon were advanced and preventive measures suggested.

Keywords: Physiotherapy; infrared; Thermal energy; Burns

Introduction

Physiotherapy is the treatment of disease, disability or malfunction of the body through therapeutical procedures that involve external stimuli like heat, radiation, water pressure, electric currents, etc. (1). Physiotherapy modalities are essentially drug-free and involve exercises and applications that facilitate pain relief and shorten the period of paralysis among others. Modalities of heat therapy include radiant heat (infrared), radio waves hot moist packs, paraffin wax bath and short wave diathermy (SWD). Heat therapy is frequently employed to treat a variety of conditions such as pain, paralysis, cancer and even leishmaniasis. As a direct consequence of the thermal energy applied to body tissues, burns of various degrees are possible. The present case involved a six-year-old HbSS patient who suffered burns secondary to heat (infrared) therapy during physiotherapy (Plate 1).

Aim/Objective

This report seeks to highlight and draw attention to the fact that all therapeutic measures have potentially harmful side effects. It is also intended to remind caregivers to adhere strictly to safety standards and measures in order to minimize such unpleasant consequences. Modalities should be introduced for early detection of telltale signs of therapy-induced burns. Appropriate first aid measures should be provided in the physiotherapy units while medical supervision should be considered in special cases such as paediatric patients.

CASE HISTORY

A six-year-old boy with haemoglobinopathy (HbSS) presented with vaso-occlusive (pain) crisis at his regular health facility. The crisis involved both legs and the pain was very severe. Intramuscular (gluteal) analgesics were given on several occasions in the course of the treatment. The child improved and was discharged on oral analgesics. A week after discharge, he was brought back with foot-drop (paralysis) involving the left foot. This was suspected to be due to trauma from the numerous injections he took in the course of managing the crisis. He was referred to the physiotherapy unit of the teaching hospital in town. After a week of infrared heat therapy, he was brought back to the referring clinic with blisters on the plantar aspects of all the toes of the left foot. The right foot was not affected. Neither were there any blisters on other parts of the body. (Plate 1). The patient was still on dressings and antibiotics at the time of reporting.

Discussion

Infrared (IR) rays are a component of the solar energy band. It is emitted as electromagnetic waves in the portion of the spectrum just beyond the red portion of visible radiation. The infrared portion of the spectrum contains the greatest amount of the sun's energy. Infrared radiation may be detected as heat using instruments such as bolometers. (2).

IR is subdivided into three segments by wavelength:

- a) 0.076-1.5 microns (=near or close wave IR)
- b) 1.5-5.6 microns (= middle or intermediate wave IR)

c) 5.6-1,000 (= far or long wave IR)

A narrow spectrum between 1.4 and 4 microns has been shown to have particularly beneficial effects on the body. Near-infrared is mostly absorbed at skin level and raises the skin temperature while far-infrared (FIR) can penetrate up to 4cm below the skin surface. It can cause deep heating effects by exciting the vibrational energy of molecules and resonating with cellular frequencies (3). This effect may not be perceived because the perception of heat functions mainly at skin level.

IR rays are artificially produced by means of many devices such as the one employed in this case (Plate 2). From the foregoing, it is clear that burns could result from the use of such devices without the patient being immediately aware of it. Modalities of treatment in physiotherapy are generally believed to be very safe and reports of burns secondary to infrared therapy are few in the literature. A recent case reported by Habib et al (2) involved a 48-year-old lady who sustained a deep burn in the right ankle as a result of using far-infrared rays for the management of chronic pain in that site. No previous case has been reported from Nigeria. However, this may not mean that it has not occurred there before. Under-reporting of cases is a perennial problem in the country.

Conclusion

There are potential hazards arising from every human activity and device. Like other branches of Medicine, physiotherapy also has its own hazards in spite of claims of safety. As shown in this case, the modalities of intervention in physiotherapy can cause unwanted effects on the patient. Physiotherapists should be conscious of this when applying the different modes of therapy.

Appropriate safety measures should be put in place while a multi-discipline approach that allows medical supervision should become an additional feature of physiotherapy units.

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List of Plates:

PLATE 1: Left foot of patient showing the blisters on the plantar surfaces of the toes.

Courtesy: Sanya Hospital, Ado-Ekiti.



PLATE 2: an infrared lamp (the type used in the reported case).

Courtesy: Physiotherapy Unit, University Teaching Hospital, Ado-Ekiti.



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