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Effectiveness of High Voltage Pulsed Current in the Treatment of Hand Burn

Thesis

Submitted for Partial Fulfillment of Master degree in Physical Therapy

By
Mohammed Taher Ahmed Omar
(B Sc. In Physical Therapy)

Cairo University
Faculty of Physical Therapy
2001

بسم الله الرحمن الرحيم

﴿اقرأ باسم ربك الذي خلق ـ خلق الإنسان من علق ـ اقرأ وربك الأكرم ـ الذي علم بالقلم ـ علم الإنسان ما لم يعلم﴾

صدق الله العظيم

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Dedication

To my parents, whom I owe my whole life.
To my brother, with all my love.
To my fiancée

Abstract

The purposes of this study were to determine the role of high voltage pulsed current in improvement of hand function in second degree thermal injured patients, and also to design ideal or recommended physical therapy management of the hand burns. Sixty voluntaries (27 males, and 33 female) were participated in this study and selected from burn unit at Ain Shams University Hospital And Om El Masryeen Hospital. They had second degree thermal burn injury since three days ago , with total body surface area of 25-35%. They were classified into two various groups; group I who received HVPC of 120 PPs of 10% intensity less than visible muscle contraction and it further classified into three subgroups according to the location of burn (group Ia, of dorsal hand burn, group Ib, of palmar hand burn, and group Ic, of circumefernitial hand burn) ,and the group II who receive placebo HVPC ,it also classified into three subgroups according to the location of burn into (group IIa, of dorsal hand burn, group IIb, of palmar hand burn, and group IIc, of circumefernitial hand burn) . Volumetric, genimetric, and dynamometric measurements were used to quantify hand volume, total active motion (TAM), of fingers and thumb, and hand grip strength respectively. Measurements were made pre, immediately after, after five, ten, and fifteen days post treatment. There were statistical significance differences in both groups within total period of treatment. It was observed that all results concerning (hand volume, tam, of fingers and thumb, and grip strength) in the first group, which received HVPC, in association of routine physical therapy have greater statistical significance improvement than the results concerning the same results of placebo group (group II). These results indicated that the HVPC might be considered as useful therapeutic tool when considering in management of acute hand burns than traditional therapy alone.

Key words (High Voltage pulsed Current, Thermal Burn, Edema, Hand Function, Grip Strength, Physical therapy).

List of Contents

List of Abbreviation

ΔP : Net Capillary Filtration.
ADM : Abductor Digit Minimi.
APB : Abdctor Pollicis Brevis.
APL : Abductor Pollicis Longus.
ASHT : American Society of Hand Therapy.
ASSH : American Society for Surgery of Hand.
CFC : Capillary Filtration Coefficient.
Cm. : Centimeter.
CMC : Carpometacarpal.
COPif : Interstitial Colloid Osmotic Pressure.
COPp : Plasma Colloid Osmotic Pressure.
DC : Direct Current.
DI : Dorsal Interossei.
ED : Extensor Digitorum.
EDM : Extensor Digit Minimi.
EI : Extensor Indicis.
EPL : extensor Pollicis Longus.
ES : Electrical Stimulation.
FDMB: Flexor Digit Minimi Brevis.
FDP : Fflexor Digitorum Superficials.
FES : Functional Electrical Stimulation.
FPB : Flexor Pollicis Brevis.
FPL : Flexor Pollics Longus.
FT : Full Thickness.
HVPC: High Voltage Pulsed Current.
Ib : Pound.
IFV : Interstitial Fluid Volume.
IP : Interphalangeal.
JL : Lymph Flow.
Jv : Net Fluid Filtered.
Kg. :Kilogram
L/P : Plasma to Protein Concentration Ratio.
LVPC : Low Voltage Pulsed Current.