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[Low-level laser therapy in osteoarticular diseases in geriatric patients]

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INTRODUCTION: Laser light absorption through the skin causes tissue changes, targeting the nervous, the lymphatic, the circulatory and the immune systems with an antalgic, anti-inflammatory, anti-edemic effect and stimulating tissue repair. Therefore low level laser therapy is now commonly used in numerous rehabilitation centers, including the "Istituto Gerontologico Pio Albergo Trivulzio", Milan, Italy. However, to activate the treatment program, the basic medical research results must always be considered to choose the best optical wavelength spectrum, technique and dose, for rehabilitative laser therapy. We analyzed the therapeutic effects of different wavelengths and powers in various treatment schedules. In particular, a protocol was designed to test such physical parameters as laser type, doses and individual schedule in different pathologic conditions. We report the results obtained with low level laser therapy in the rehabilitation of geriatric patients, considering the various physical and technical parameters used in our protocol. **MATERIAL AND METHODS:** We used the following laser equipment: an HeNe laser with 632.8 nm wavelength (Mectronic), a GaAs Laser with 904 nm wavelength (Mectronic) and a CO₂ Laser with 10,600 nm wavelength (Etoile). To evaluate the patient clinical status, we use a different form for each involved joint; the laser beam is targeted on the region of interest and irradiation is carried out with the sweeping method or the points technique. Irradiation technique, doses and physical parameters (laser type, wavelength, session dose and number) are indicated on the form. The complete treatment cycle consists of 5 sessions per week--20 sessions in all. At the end of the treatment cycle, the results were scored on a 5-grade semiquantitative scale--excellent, good, fair, poor and no results. We examined 3 groups of patients affected with gonarthrosis (149 patients), lumbar arthrosis (117 patients), and algodystrophy (140 patients) respectively. **RESULTS:** In gonarthrosis patients, the statistical analysis of the results showed no significant differences between CO₂ laser and GaAs laser treatments ($p = .975$), but significant differences between CO₂ laser and HeNe laser treatments ($p = .02$) and between GaAs laser and HeNe laser treatments ($p = .003$). In lumbar arthrosis patients treated with GaAs or HeNe laser, significant differences were found between the two laser treatments and the combined sweeping-points techniques appeared to have a positive trend relative to the sweeping method alone, especially in sciatic suffering. In the algodystrophy syndrome, in hemiplegic patients, significant differences were found between CO₂ and HeNe laser treatments ($p = .026$), between high and low CO₂ laser doses ($p = .024$), and between low CO₂ laser dose and high HeNe laser dose ($p = .006$). **CONCLUSIONS:** Low level laser therapy can be used to treat osteoarticular pain in geriatric patients. To optimize the results, the diagnostic picture must be correct and a treatment program defining the physical parameters used (wavelength, dose and irradiation technique) must also be designed.

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