

Appendix 1. Tactile stimulation short-term program

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Three interviews were conducted by the researcher with the participant and her assistant/partner. In the first interview (on day 1), the researcher measured pain clinical status, body esteem, body awareness and tactile acuity. Then, the procedure to follow was explained and a demonstration of the tactile stimulation to the assistant/partner was performed. At the same time, all the materials were provided to carry out the procedure (tactile stimulation probes, an illustrative diagram with the numerical denomination of the seven points to stimulate, random distribution tables printed for collecting the results, a thin marker and a pencil with eraser). In the second interview, after 10-11 days. The tactile stimulation exercises were re-demonstrated by readjusting the stimulation distances according to changes in the previously evaluated thresholds of TPD. In the third interview, 21 days after the start of the stimulation program, the participant was evaluated again as in the previous sessions. Participant's assistant/partner was instructed to carry out the home daily tactile stimulation session. The participant received follow-up telephone calls to ensure that the tactile stimuli went smoothly. Once the program of three interviews was completed, all the participants were asked to assess the credibility and difficulty of the tactile stimuli program using a Visual Analogue Scale.

Tactile stimuli procedure

Probes size and location discrimination

In the face-to-face session with the researcher, he evaluated the two-point discrimination threshold (TPD; in mm) in the cervical region of the participant (9). Briefly, a 2-point aesthesiometer was placed under its own weight on the participant's skin overlying the spinous process of the 7th cervical vertebra (Fig. 1), with the participants eyes closed, and ensuring simultaneous contact of the 2 tips (9). The initial separation between the aesthesiometer's tips was

30 mm. In series of 10 stimulations, participants were asked to report if the contact with the tips was perceived at either 1 or 2 points. The distance between calliper's tips was recorded as the TPD threshold, if the patient reported having perceived the stimulus at 2 different points at least on 7 of such 10 repetitions (9, 70). Otherwise, a new series of 10 stimulations was performed by increasing tip separation by 2 mm (8, 9). Once the researcher determined the TPD threshold value, he marked seven numbered and equidistant points on a transparent plastic sheet, organised as hexagon's vertices adding a central point (Fig. 1). The separation between the points, were equivalent to the TPD threshold obtained in the exploration of the participant (32, 35). The seven points were marked with an indelible and thin marker on the participant's skin. The approximate location of the seven points were represented on a map of the cervical region printed in DIN A3 size, and they were numbered from 1 to 7 to name them in later sessions using this nomenclature (Fig. 1). The tactile discrimination exercise executed by the participant with the help of her assistant/partner consisted of the assistant touching the skin of the cervical-scapular region of the participant with the probe in one of the seven points determined in the face-to-face session for 1-2 seconds. For this purpose, the assistant/partner used a plastic probe with a large (10.5 mm radius) or small (3.5 mm) contact surface. The participant must concentrate on the tactile perception with the aim of identifying which of the seven points was received contact from the probe (32, 35) (having in front an illustrative diagram of the cervical-scapular region with the numerical denomination of the seven points) and also, determine which of the two types of probe was used for each stimulation, whether large or small (32, 35). In addition, tables of random distribution of both the stimulation points and the type of probe used were elaborated, and the order of presentation of the stimulation tables to each participant was randomized following the methodology of

other researchers (35). Therefore, three blocks of 24 random stimuli were made per day (32), and so on during the 21 days of the program. In the face-to-face sessions, the answer sheets issued by the assistant/partner was collected, the researcher realised the same tests on the participants and the record was used to calculate the number of probe size and stimulus location hits.

Graphesthesia training

Graphesthesia consisted of the identification throughout mental visualisation patterns of letters drawn by the assistant/partner on the skin of the participant (Fig. 1). This procedure is carried out in the framework of tactile acuity improvement and is used as part of the somatosensory assessment test battery in neuropathic patients (71) and in people suffering from chronic pain (22, 23, 72). The task consisted of tactile stimulation of capital letters 2-3 cm high drawn by the assistant/partner on the skin of the cervical-scapular area of the participant by means of a small eraser located in the back area of a pencil. The participant requires to concentrate on her perception, visualises and identifies the graphic character that is being represented on her skin. In order to carry out the procedure, a table was prepared with a random distribution of 60 possible characters and the assistant/partner was instructed to write down the answers that the participant indicates after each identification. If the answer was correct, the participant was informed of her success, and if not, she was informed of the correct answer and then traced again until the 60 character/participant/day pattern was completed. Finally, in the face-to-face sessions, once the answer sheet issued by the assistant/partner was collected, the researcher was performed the same task and the record was used to calculate the number of hits per participant.

The control group

In the group exposed to tactile stimulation alone, each participant was received the same tactile stimuli, except that they have not asked to concentrate on their

tactile perception nor have they asked to identify the stimulus. So, the subject's attention to tactile perception is considerably diminished (35). Similarly, during graphesthesia task, they should not identify the character drawn, only relax during the procedure and more than one participant reported being drowsy. Moreover, in order to distract the participant, they were instructed to count the number of stimulations received during tactile stimulation and were not shown the map of the cervical area.

Credibility and difficulty of the tactile stimuli program

The credibility of the program was measured to check whether the participants are blinded to the group they belong to (31). "The credibility" was defined by an *ad hoc* question created as "the program was useful, that it was reliable", measured by means of a VAS scale of 0-10 cm, where 0 indicates "nothing credible" and 10 indicates "completely credible". On the other hand, the difficulty of the proce-

cedure was estimated to evaluate whether the program is reproducible. This was done, using a VAS scale of 0-10 cm, where 0 indicated "no difficulty" and 10 indicated "extreme difficulty", and the difficulty was defined as "Problems doing it, either in terms of space, time or not knowing what to do at certain times".