ALGOMETER FOR ASSESSING PRESSURE PAIN THRESHOLDS

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INTRODUCTION: Muscular and joint injuries and localized pain can be occasioned during sports practice. Although the reliability of palpation techniques (to evaluate muscle and joint tenderness) has improved and algometers have been developed[1], they do not simulate the palpation technique and real time measurements are not possible. A new pressure algometer to determine pressure pain thresholds in real time has been developed, to be used in diagnosis and injury treatment evaluation of athletes.

METHOD: The *sensor element:* is a cast composite film prepared with rubber (DSM Co.), a conducting filler (Eeonix Co.) and crosslinker (Hoechst). The *sensor system* (Fig. 1A): the "top" is a rounded retractile point and the "base", a nylon cylinder in which aluminum parts and the composite film connect a two-point electrical circuit. The whole system is a handheld "pen" device (Fig.1B). The *data conditioning system* is a common-emitter transistorized amplifier. The software was programmed in C++ language (data acq.: 10 kHz). Five calibration experiments were conducted using a reference load cell. Each dynamic experiment consisted of six cycles of compression/decompression in a stress-strain machine (EMIC, DL 3000). The potential difference produced in the sensor by the applied force was acquired with a PCMCIA PC CARD, DAS 16/16 – AO - *Computer Boards*®, A/D converter (16 bits, 16 channels, bipolar input: ± 1.25V - ± 10V).

RESULTS AND DISCUSSION: Linearity of the load cell: r^2 = 0.99999. The sensor response is similar to the reference (Fig.1C), even at different acquisition rates and at several cycles.

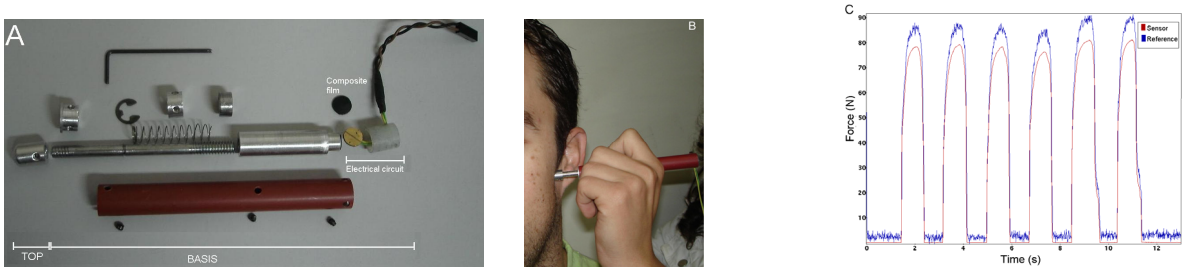

Figure 1: A) Sensor parts; B) Sensor in use; C) Curves of Force vs. time (dynamic response).

CONCLUSION: The sensor prototype showed a nearly linear dynamic response, compared to a reference system. Validity and reliability of the system is still in progress.

REFERENCES:

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