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GENETICS INSTITUTE**

PRESENTATION OF WORK ACCOMPLISHED

AUTHORS OF PROJECT :

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1 - Title (in block capitals) :

EFFICACY OF TREATMENT USING GAS CRYOTHERAPY IN HEMORRHAGIC
EVENTS IN HEMOPHILIACS.

2 - Summary of work

Hemorrhage is an emergency in hemophilia management. These bleeding events (hematomas or hemarthroses) are always accompanied by an inflammatory reaction which may be very marked. The painful reaction is sometimes very severe, requiring the use of class III analgesics and anti-inflammatory drugs, steroidal or not. Resorption of a bloody effusion and resolution of the inflammatory reaction may take several weeks, during which physiotherapy is difficult. We looked for a non-invasive technique enabling the rapid management of bleeding events. Gas cryotherapy provides a very marked "thermal shock" in less than 2 minutes, accompanied by tissue massage. It has concomitant analgesic, anti-inflammatory and anti-edema effects. Trials in hemophiliacs show a spectacular effect on the resorption of hematomas and an immediate analgesic effect in acute hemarthroses. We also found it to be effective on inflammatory processes and chronic joint effusions. In all cases, symptomatic improvement was rapid, enabling effective physiotherapy and an early return to active life. This technique hence offers a considerable improvement in the everyday life comfort of these patients.

3 - Main work of the candidate during the past 5 years :

Nadine Alliaume - Nurse :

- Implementation of an electric stimulation protocol in hemophiliacs.
- Creation of hemophilia care structure in Lyon Regional Hemophilia Treatment Center.
- Development of care and emergency management procedures
- Creation of regional nursing care file.
- Supervision of self-treatment

Work of Dr Lienhart : see attached sheet.

4 - Work done :

4.1. Objective

Tolerability and efficacy of cryotherapy in hemophiliacs :

- Acute bleeding events :
 - hematomas,
 - hyperalgetic and voluminous hemarthroses.
- Chronic hemorrhagic events.
- Chronic joint effusions.
- Inflammatory lesions.

4.2 Previous work on subject (references, context) :

ALL IN FRENCH - TRANSLATIONS BELOW

- Treatment of edema in maxillo-facial surgery by gas cryotherapy - Professor A.Wilk.
- Gas cryotherapy and rheumatology in office practice - Alain Cornic.
- Study of the effect of gas cryotherapy treatment on pulled muscles - Dr A.Menjuc.
- Gas cryotherapy in the treatment of trauma in high performance athletes - François Buffaud (Sports Medicine Center, Limoges, France).
- Usefulness of gas cryotherapy in immediate postoperative care after hand surgery - Dr Bertrand Fritch.

4.3. Material and methods :

Material : Cryotron (Cryonic Médical) delivering medical CO₂ at - 78°C and 50 bars pressure, creating a thermal shock in less than 2 minutes, accompanied by tissue massage.

Method :

Study of analgesic effects by evaluation of :

- analgesic intake,
- measurement of joint amplitudes.

Study of anti-inflammatory and anti-edema effect by :

- corticosteroid or NSAID intake,
- measurement of edema,
- hematoma size by centimeter tape measure,
- evaluation of recovery time (return to active life).

4.4. Results :

Thanks to the loan of a machine for 3 weeks, we were able to treat :

- A hematoma of the plantar arch : diameter = 5 cm. After three 45-second sessions at 15-minute intervals together with ice packs applied to the thigh, the hematoma became very pliable, with a diameter of less than 1 cm. No NSAID nor analgesics taken (2 infusions of anti-hemophilia factor). No time off work.
- A hematoma of the long biceps thigh muscle present for a week and measuring 15 cm x 15 cm. After five 45-second sessions, the hematoma measured only 8 cm x 8 cm. After 20 sessions, the diameter of the hematoma was 3 cm. Limping disappeared in a week. No anti-inflammatory nor analgesic.
- An acute hemarthrosis of the elbow in a child : 1 session. Immediate analgesic effect. Improved mobility in 24 hours.
- 1 chronic knee joint effusion : five 45-second sessions + ice packs of popliteal and inguinal folds. Very marked improvement by third session. Decrease in size of knee and decrease in local heat.
- A paraprostatic inflammatory event affecting the knee. Decrease in pain by second session, and disappearance of signs of inflammation.
- Immediate analgesic effect on exacerbation of knee osteoarthritis in a 68-year-old patient with severe hemophilia A.

4.5 Conclusion, usefulness of work done :

Gas cryotherapy :

- is very well tolerated, even in children.
- Enables very fast resorption of hematomas.
- Has an immediate analgesic effect (hematoma, hemarthrosis, inflammatory or osteoarthritis syndrome).
- Leads to decreased intake of medicines.
- Enables fast mobilization so more effective physiotherapy.

4.6. Perspectives :

Purchase of a machine would enable :

- the incorporation of cryotherapy as an integral part of emergency protocols for the management of hemarthroses and hematomas;
- the Regional Hemophilia Treatment Center to become a cold site:
 - * enabling on site treatment by a center RN;
 - * the nurse could have a one day training assignment to become more familiar with the cryotron and cryotherapy and take on the management of patients not only in the center but also in medical or surgical in-patient departments.
- the undertaking of efficacy tests in chronic joint disease, exacerbations of osteoarthritis and orthopedic postoperative care.

Application to be returned before 31 May 2000 to the following address :

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