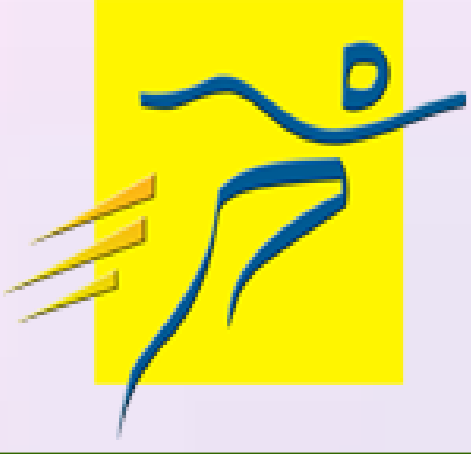


Hyaluronic acid in healing non arthrosic cartilaginous pains of the athletes (about 271 cases)



Jérémy Volante, Marc Bouvard

Centre de Biologie et de Médecine du Sport de Pau 4 boulevard Hauterive, 64046 Pau cedex, France

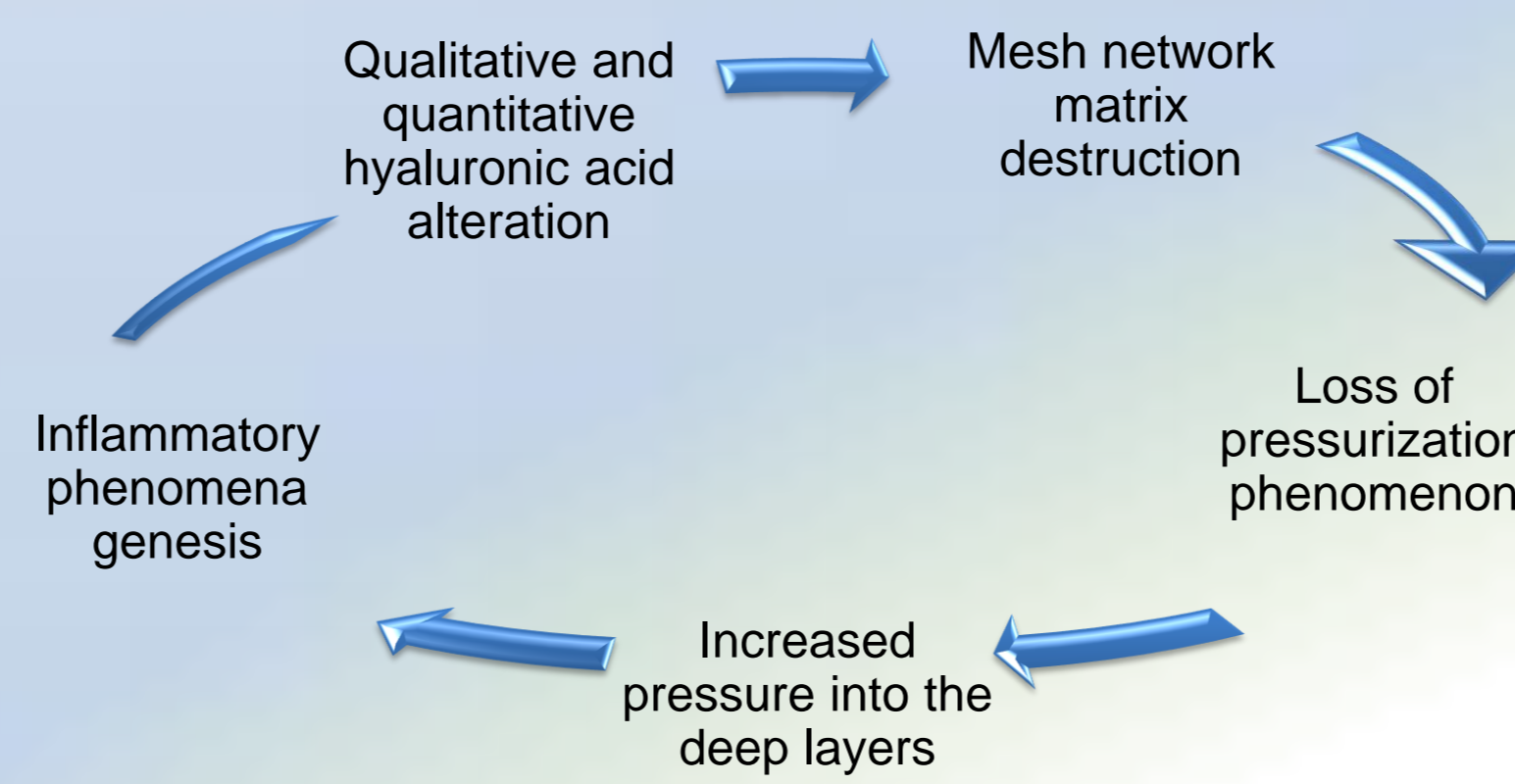
Introduction:

Athlete's problem



- Repeated high articular stress
- Sport's relative risk >1,72
- Early appearance of traumatic/microtraumatic cartilaginous pains
- Light armamentarium
- Worse pain relief caused by sport continuation

Vicious noxious circle of cartilage



Endogenous and exogenous Hyaluronic Acid (HA)

- Endogenous ubiquitous diholoside (hexabiose)
- Gives synovial fluid viscoelastic rheologic properties
- Involved in extracellular matrix synthesis
- Anti-inflammatory part mainly against Interleukin-1 associated with lymphocytes mobility/poly-nuclear phagocytosis alterations
- Production via microbial fermentation or roost combs extraction
- Exogenous AH : impaired endogenous substitute even autocrine synthesis (viscoinduction)
- Marketing authorization for symptomatic gonarthrosis (French Health Social Security)

Could hyaluronic acid be an effective therapeutic in healing traumatic/microtraumatic (early osteoarthritis stage) cartilaginous pains of the athletes



Materials and methods:

Retrospective study (Level 4) from patients treated with HA for traumatic/microtraumatic cartilaginous injury (from June 2000 to April 2010, Centre de Biologie et de Médecine du Sport de Pau)

Objectives:

- Assess viscosupplementation on pain's relief and sport's level
- Search remanence in case of several protocols
- Show efficiency variation between different used products
- Define prognosis factors which could interfere with efficiency (only for knee because of sufficient number of cases)

Recruitment terms

Inclusion/ eligibility criteria

- > Age over sixteen
- > Patient spontaneously appearance or sent by doctor for cartilaginous pain
- > Precise diagnosis with radiological confirmation (X-rays, MRI, CT-artrography)
- > Absence of osteoarthritis criteria in reference to the American College of Rheumatology (osteophyte, joint space narrowing, subchondral bone sclerosis, geodes)
- > Whole viscosupplementation procedure realized and clearly established

Exclusion criteria:

- > Diagnosis insufficiency
- > Intercurrent disease or treatment
- > Incapacity to fill a medical form sent by e-mail, mail, or phone call

Therapeutic terms

After given oral and written information about therapeutic terms, benefits and risks, patients underwent whole protocol in compliance with pharmaceutical firms recommendations. Each injection was preceded by 3 times disinfection and 1cc saline/xylocaïne injection (the absence of valve pushing resistance proves the good intra-articular position of the needle). The relay xylocaïne-physiological serum follows published studies asserting chondral injuries time-dependant with local anesthetics. A radiological guidance was used for needle's positioning for hip, after plan by plan anesthesia with xylocaïne.

Evaluation terms:

Evaluation was made by medical record files plus a medical form (only patients who filled the form were included), and efficiency assessment by clinical criteria based on pain digital scale (0-10) before and after injection, either on dialy pain relief. Patient satisfaction was estimated on a ladder (from 0 to 4) just as sport/job level evolution.

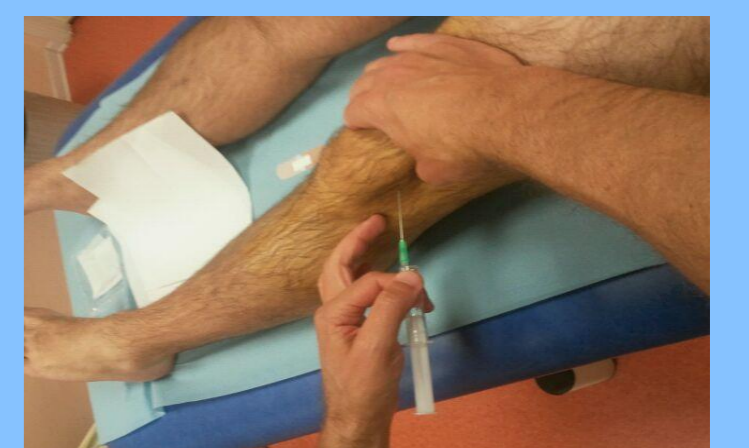
2 groups were defined regarding to treatment objectives:

Group 1 : patients with professional/sports activity > 2 hours a week soliciting the hurt joint,

Group 2: patients with occasional sport activity (<2 hours) and/or a non requesting hurt joint professional activity, (included patients who chose to stop requesting activity after injections).

For the knee, ICRS staging was carried out.

Types of sports were split up into 3 classifications for prognosis evaluation: on line/pivot sport, weight-bearing / non weight-bearing sport, amateur/professional athlete

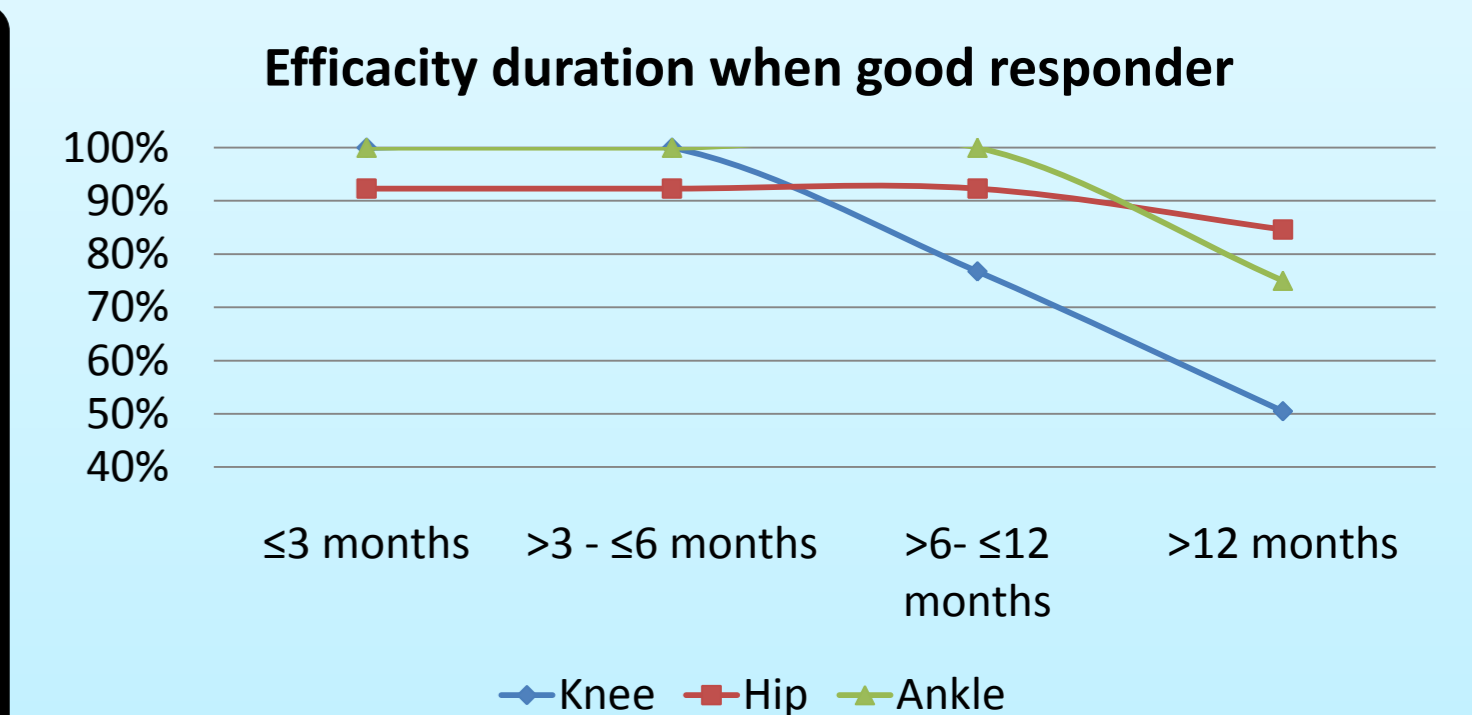
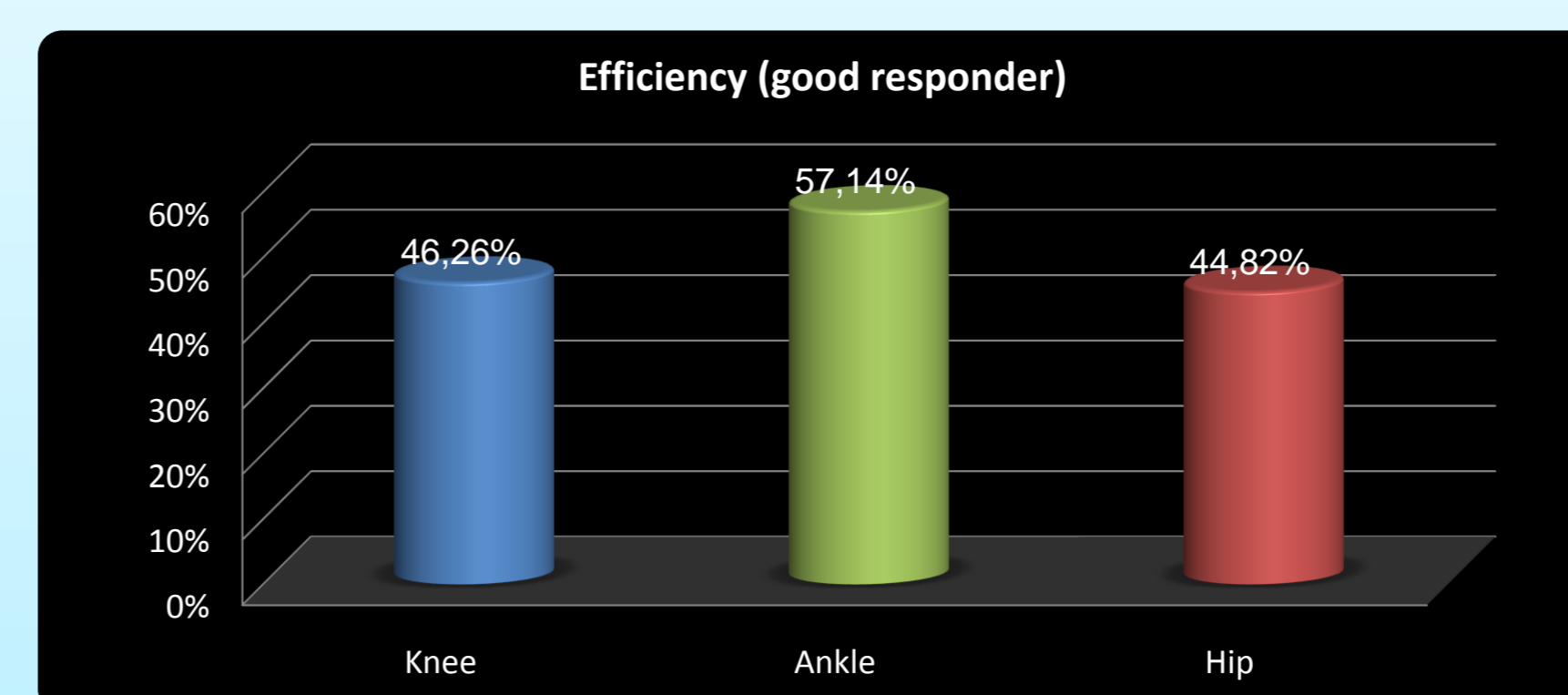
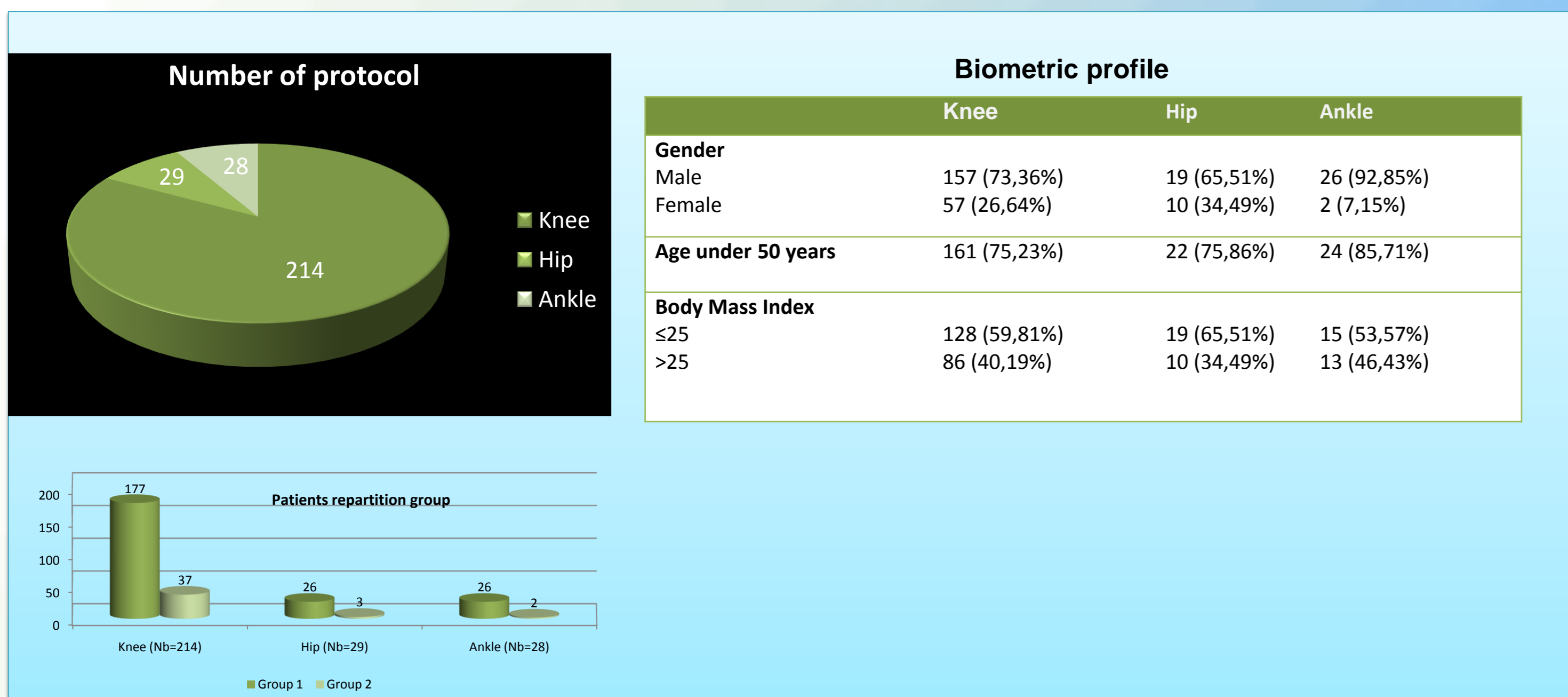


Response criteria:

- Group 1 : Digital Pain Scale post protocole <2, associated with patient satisfaction ≥ 3 sport/ professional preservation,
- Group 2: Digital Pain Scale <2 associated with patient satisfaction ≥ 3 , dialy pain relief

Résultats:

271 protocols were realized and distributed in 3 joints; all with cartilaginous traumatic/microtraumatic injury. Some patients benefited from repetition of protocols (study=10 years). Seven products were used (about 90% for Arthrum™, Durolane™ and Sinovial™. 18 (6,64%) patients benefited first of injection of steroids because of swelling. Twelve sides effects were notified (4,42%), essentially represented by an extended pain over 48 hours (7) or a moderate stiffness quickly reduced (4). No infectious complication was notified.



Prognosis factors:

- ICRS grading severity has no impact (p=0,17), neither lesion site (femoropatellar or femorotibial)
- The pursuit of a requesting hurt joint activity (sport/job) is associated with a loss of efficiency .
- No biometric impact
- Preliminary steroids injection has no impact on efficiency (p=0,80)
- No difference between the most three products used (Arthrum™, Durolane™, Sinovial™) on efficiency

Conclusion:

Viscosupplementation is a former therapeutic but its efficiency is not yet well established, except for knee osteoarthritis (with meta-analysis). This study is the first time in medical literature for assessment of hyaluronic acid efficiency in early stage of osteoarthritis in knee, ankle, and hip. Beware of the low level of evidence (level 4), otherwise it shows interesting results (terme of response over 6 months in 90% of cases, and over one year in 60-85% of cases. It can introduce a debate about interest of an earlier treatment for cartilaginous injuries, no matter the localization (knee, hip, ankle). This current debate already exists for the hip with some studies

showing a loss of efficiency according to Kellgren grading severity. Our results are like-for-like to knee, ankle, and hip osteoarthritis. Our criteria suit well with sportmen expectation, and hyaluronic acid helped us healing patients with usual drugs pain resistance. Naturally randomized studies are necessary to give a reliable assessment of efficiency with wide sample to limit the high placebo Effect Size.

Finally, this study gives new orientations regarding researches about viscosupplementation. With confirmation, it could allow the extension of the potential scope of the hyaluronic acid and a modification of medical practices in favour of a early care of the cartilaginous lesions