Association Between Medial Meniscus Extrusion (MME) and Clinical Manifestations of the Elderlies Who Show Primary Stage Knee Osteoarthritis (OA) with No Need for Treatment – A Populationbased Cohort Study “Sportology Core Study 2”

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Background: An approximately 50% and 20% of the Japanese female and male, respectively, can currently become 90 years old in Japan. It is estimated that 25 million people who are fifty years old or older show radiographic knee OA, and that >70% of female in seventies and >80% of female in eighties show radiographic knee OA, although those with radiographic knee OA do not always have knee pain. Recent researches for the pathophysiology of knee OA have revealed that medial meniscal extrusion (MME) is one of the frequent findings of knee OA. MME is also speculated to play an important role for the pathophysiology of knee OA; e.g. MME is associated with the cartilage damage and progression of the disease. It is unclear what are the OA-related structural changes associated with the clinical manifestations of elderlies who show the primary stage of knee OA with no need for treatment.

Purpose: The aim of the present study was to examine whether MME was associated with the clinical manifestations of elderlies who show the primary stage of knee OA with no need for treatment.

Methods: Among 325 subjects, who were enrolled in the population-based cohort study in our university, seventy-nine (24%) who showed the primary stage of knee OA showing the Kellgren–Lawrence (KL) grade 2 on radiography were analyzed in the present study. The written informed consent was obtained from all subjects. The subjects were 73.5 years of age on average with 23.3 kg/cm² of BMI. 48% of the subjects were female. The medial joint space width (JSW) of knee joint and femoral-tibia angle (FTA) were measured by radiograph. MME was evaluated by 0.3 Tesla system of MRI. The muscle strength of the lower limbs was measured using BIODEX. A walking speed, 3 m timed up-and-go (TUG) test, and grip power were also measured. The clinical manifestations of the subjects were evaluated by the visual analog scale (VAS; 0–100) for pain and Japanese Knee Osteoarthritis Measure (JKOM), which is a patient-based, self-answered evaluation score. A p value <0.05 was considered to be statistically significant. All analyses were undertaken using the statistical package SPSS for Windows.

Results: While all the subjects in this study showed the same grade of radiographic primary stage of knee OA, K/L grade 2, the MRI-detected OA structural scores were ranging from 8 to 55 points of WORMS (22.2 points on average, SD: 10.8). The FTA of the subjects were 177.6 ± 2.5 degrees. The MME of the subjects were ranged

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from 0 to 8.4 mm (3.6 points on average, SD: 2.0 mm). The FTA were associated with MME in the subjects ($r = -0.297$, $p = 0.010$). The MME were associated with the WOMS total scores in the subjects ($r = 0.409$, $p < 0.001$). No or less pain (< 10 point of VAS) was complained from most of the subjects (87%). The JKOM total scores were associated with the MME in the subjects ($r = 0.291$, $p = 0.009$). The JKOM category II (pain and stiffness; $r = 0.294$, $p = 0.009$) and JKOM category III (activities of daily living; $r = 0.234$, $p = 0.009$) were associated with the MME in the subjects, respectively, while JKOM category IV (social activities; $r = 0.131$, $p = 0.248$) and category V (general health conditions; $r = 0.221$, $p = 0.051$) were not. The muscular strength of the lower limbs were inversely associated with MME in the subjects ($r = -0.50$, $p < 0.001$). The walking speed ($r = -0.46$, $p < 0.001$) and TUG ($r = 0.29$, $p = 0.009$) were also associated with MME in the subjects.

Conclusion: MME was associated with the clinical manifestations of the elderlies who showed radiographic primary knee OA without any requirement for treatment.

Key words: knee osteoarthritis (OA), medial meniscal extrusion (MME), cohort study, locomotive syndrome, muscular strength