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ASSOCIATION OF BODY MASS INDEX TO MENISCAL AND CHONDRAL CHANGES IN ANTERIOR CRUCIATE LIGAMENT INJURED KNEES

Orthopaedics

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ABSTRACT

ACL injuries are extremely common[1]. Concomitant meniscal and chondral injuries add to the treatment cost & influence the rehabilitation protocol and long term results of ACL reconstruction[2–4]. Researchers have tried to attribute these associated injuries to delay in surgery,age,sex,anthropometric parameters and body mass index(BMI)[5–8]. This cross sectional study aims to evaluate the association of spectrum of meniscal and chondral lesions to the BMI of subjects with ACL injured knees. We found that though medial and lateral meniscal injuries as well as chondral changes were noted more in subjects with high BMI, the association was not significant. In subjects with combination of meniscal and chondral lesions, there was no significant association noted to BMI.

KEYWORDS

ACL injury, BMI, Meniscal tears, Chondral injury

I. INTRODUCTION

ACL injuries and their arthroscopic reconstruction are frequently performed. Though ACL provides around 85% of restrain to anterior drawer[9],isolated ACL injuries are uncommon[10]. Due to static and dynamic stability conferred by osteoarticular framework and menisci, ACL injuries are frequently associated with meniscal and chondral injuries. As these structures in combination helps to perform complex biomechanical functions along with the cruciate ligaments and collaterals, combined injuries have a profound impact on post-operative function, proprioception & stability[11,12]. Researchers have tried to uncover the effects of associated meniscal and chondral lesions to factors like increasing age, time from injury, gender, alignment of knee and obesity[13–16].This study attempts to look into the association of Body Mass Index (BMI) to concomitant meniscal and chondral injuries in ACL deficient knees. We have also tried to study the commons patters of concomitant medial and lateral meniscal injuries in ACL injured knees, and to look for its association with BMI.

II. MATERIALS AND METHODS

We studied 106 patients aged between 20-45years who underwent arthroscopic anterior cruciate ligament reconstruction in our hospital between July 2019 to May 2021. Patients with prior knee surgery/prior knee pain/intraarticular knee fractures / multiligament injured knees were excluded. Preoperative clinical findings, age, gender, height, and weight documented using a structured questionnaire. Arthroscopic findings of associated meniscal and chondral lesions were also documented. Subjects were grouped into two on the basis of BMI-Normal & overweight. Statistical tests were done to look for association between BMI & spectrum of meniscal and chondral lesions.

2.1 statistical analysis

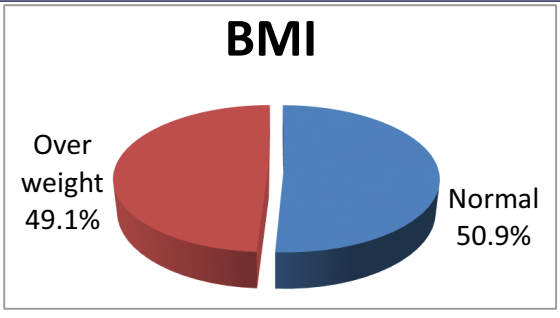
The association between meniscal and chondral lesions to BMI was done after categorizing the participants into two strata based on BMI. Parameters of lateral meniscal injuries, lateral sided tibial & femoral chondral injuries, medial meniscal injuries , medial sided tibial & femoral chondral injuries , chondral lesions of patella, & trochlea were analysed using chi-square. Relative risk calculation was done to assess the magnitude of association (SPSS for windows version 17). Statistical significance was set at <.05.

III. RESULTS

3.1 Demographic profile

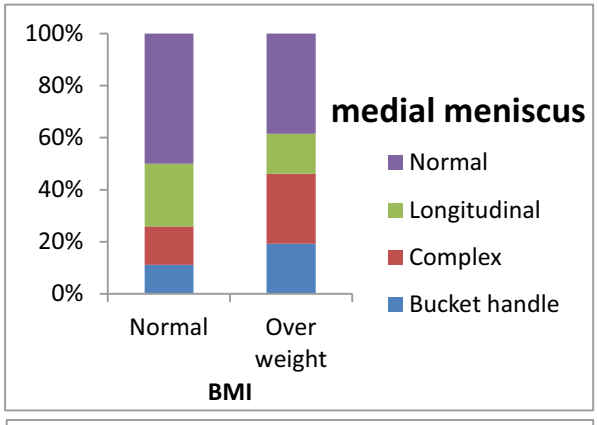
We had 106 subjects of which 90 (82%) were males and 16 (18%) were females. 52 subjects were overweight of which 12 (75%) were females and 40(44%) were males.

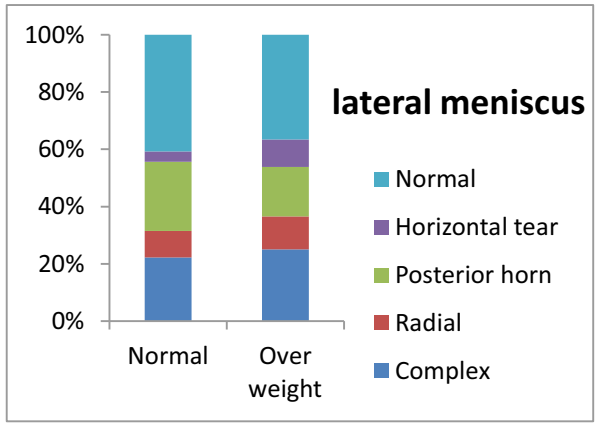
Sex	Frequency	Percent
Male	90	82
Female	16	16
Total	106	100.0



3.2 Concomitant meniscal and chondral lesions

Medial and lateral meniscal injuries were classified based on tear morphology and cartilage lesions were classified based on International cartilage Repair Society (ICRS) classification.





Lateral meniscal injury was present in 65 subjects- of which59 %(32/54) had normal BMI as compared to 64%(33/52) of overweight subjects(p=0.657). Medial meniscal injury was present in 59 subjects of which 50%(27/54) had normal BMI as compares to 62%(32/52) of overweight subjects(p=0.232). Chondral changes were present in 85 %(46/54) of normal BMI and 90 %(47/52) of overweight subjects (p=0.415). Medial femoral chondral changes 19(9+10) were the commonest of chondral lesions followed by lateral tibial condyle 18(6+12), patellar 15(8+7), medial tibial condyle 10(3+7), lateral femoral condyle 6(2+4) and trochlear lesions 5(2+3).

IV. DISCUSSION

In our study of 106 subjects with ACL injuries, the majority of patients were males (82%). 52 subjects (49%) were overweight. Concomitant chondral lesions seen in 93 subjects (87%) were the commonest. Lateral meniscal injuries (61%) were commoner than medial meniscal injuries (56%). Complex tears were the commonest subtypes of medial and lateral meniscal tears. Though concontant medial meniscal, lateral meniscal and chondral changes were noted more in subjects who were overweight (with p values 0.232, 0.657, 0.415 respectively), the association was not statistically significant. This is in sharp contrast to observations of Traven et al[17] suggesting increased meniscal and chondral injuries with high BMI , and observatins of Kluczynski et al[13] suggesting increase chondral injuries with increasing BMI.

V. CONCLUSION

Though literature stands divided on the association of BMI to concomitant meniscal and chondral lesions, our study shows that despite mild increase in lesions with increasing BMI, there is no statistically significant association between the two. Further studies involving more study subjects may be recommended.

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