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Early follicular and Mid-luteal phase associated changes in Lower extremity Muscle strength , length and Agility in amateur female athletes – a Prospective Analytical study

Background: The cyclical endocrinological changes during the menstrual cycle, through their influence on connective tissue properties and other physiological variables, have been shown to affect various physical performances parameters in females. Agility, lower extremity muscle length and strength are important determinants of athletic performance. However the existing literature gives contradictory evidence regarding the association between phases of menstrual cycle and the variables of strength, flexibility and agility in females. **Methods:** A prospective analytical study was designed and a total of 99 eumenorrhic amateur female athletes (21.2 ± 2.02 years) were recruited. The menstrual cycle was tracked and the different phases were identified with the help of mobile application and basal body temperature changes. The specific outcomes of agility (Illinois agility test), lower extremity muscle strength (Dynamometry) and lower extremity muscle length (Goniometry) were assessed on the 5th and 23rd day of menstrual cycle corresponding to the early follicular phase and mid-luteal phase. Difference in outcome variables were compared across the two phases using Wilcoxon signed rank test. **Results:** The study found that there is a statistically significant difference in the agility scores with marginally better performance exhibited in the mid luteal phase. There was a slight decrement in strength in early follicular phase in all lower extremity muscle except right Dorsiflexors. A statistically significant difference found in muscle length of bilateral Hamstring and Rectus femoris. **Conclusions:** The present study showed that there is a very marginal but a statistically significant improvement in lower extremity muscle strength as well as agility during mid luteal phase of menstrual cycle when compared with early follicular phase. However the magnitude of these changes were extremely small, and most likely may not play any role in actual athletic performance in amateur female athletes