

Seasonal Variations in SCFE: A Wisconsin-Based Epidemiological Analysis

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INTRODUCTION: Slipped Capital Femoral Epiphysis (SCFE) is a common pediatric hip disorder typically occurring during the adolescent growth spurt. Prior investigations have identified seasonal variation in incidence across various geographic regions, yet this association remains underexplored in Wisconsin. Furthermore, the influence of socioeconomic status, quantified by the Area Deprivation Index (ADI), on both the incidence and severity of SCFE presentation has not been adequately examined. The objective of this study was to evaluate seasonal variation in SCFE incidence within Wisconsin and to assess potential associations between ADI, body mass index (BMI), and slip severity.

METHODS: A retrospective review was conducted of children diagnosed with non-traumatic SCFE in Wisconsin between January 2012 and March 2024. Of 160 patients screened, 110 met inclusion criteria. 47 were female and 63 were male. Demographic and clinical variables collected included age, sex, race, ADI, BMI, month of onset, Southwick slip angle, stability, chronicity, and duration of symptoms prior to diagnosis. Monthly incidence was analyzed using three-month rolling averages and sinusoidal regression modeling. Comparisons between high-incidence months and low-incidence months were performed using chi-squared tests. Linear regression models assessed relationships among ADI, BMI, and slip angle. Nonparametric analyses evaluated the associations between symptom duration, cartilage state, and slip chronicity. IRB approval was granted for the use of all data in this study.

RESULTS: Sinusoidal regression demonstrated statistically significant seasonality in incidence, mean ADI at presentation, and mean slip angle (all $p < 0.05$). Incidence was higher between July and January compared to February through June ($p < 0.05$). Patients presenting during the lower-incidence months of February through June exhibited higher mean ADI values and greater slip angles. Linear regression analysis revealed significant correlations between ADI and slip angle ($r = 0.29$, $p < 0.05$) as well as between ADI and BMI ($r = 0.33$, $p < 0.05$), while no significant correlation was observed between BMI and slip angle ($p > 0.05$). Symptom duration was significantly associated with cartilage status ($p < 0.005$), and chronic slips demonstrated higher slip angles compared with acute presentations ($p < 0.05$).

DISCUSSION: SCFE in Wisconsin demonstrates a seasonal pattern, with peak incidence observed between July and January. Patients presenting during lower-incidence months were more likely to come from socioeconomically disadvantaged communities and to exhibit more severe slips. ADI showed modest associations with both BMI and slip severity, although causality cannot be inferred from this observational design.

SIGNIFICANCE/CLINICAL RELEVANCE: Recognition of seasonal variation in SCFE incidence may assist clinicians in maintaining a high index of suspicion during peak months. Awareness that patients presenting in low-incidence months may have greater disease severity and socioeconomic vulnerability highlights the importance of early imaging and referral.

Level of Evidence: IV