

The Effect of the MLB Foreign Substances Ban on Upper Extremity Injury Incidence and Severity

INTRODUCTION/STUDY QUESTION:

There is an eternal struggle in baseball between pitchers and batters for dominance. For years, pitchers have rubbed or “doctored” baseballs with foreign substances such as soil, sweat, rosin, paraffin, hair gel, and sand-paper in order to reduce the slickness of the baseball to improve control and spin rates of their arsenal of pitches thus making them more able to best a batter. Pitchers have estimated that 80-90% of their colleagues “doctor” baseballs. While the most common combination used by pitchers is rosin and sweat, in recent play, substances such as spider tack and pine tar have been used to this effect with arguments that pitchers have created an unfair advantage over batters as evidenced by historically low league batting averages in recent years (.240s compared to the .260s and .270s in the 1990s and 2000s). On June 15th, 2021 Major League Baseball announced stricter enforcement of rules that prohibit the application of foreign substances to baseballs. In response to this, many pitchers ceased “doctoring” baseballs mid-season but had concerns that the abrupt, renewed slickness of the baseball would lead to increased throwing arm injuries due to having to deepen and tighten their grip on the baseball. This study aims to determine if an increase in upper extremity injury incidence and severity occurred following the MLB ban on foreign substances.

METHODS:

A retrospective analysis of Major League Baseball’s transactions database was performed for all players who sustained an upper extremity injury within the time frame of June to October 2021, the regular season during which the ban was enforced, and June to October 2019 as a control group. Data from 2020 was excluded due to the COVID-19 pandemic abridged season. Injuries for pitchers and catchers were included as they are involved in repetitive throwing more than any other player on the field. Injuries were excluded if they were traumatic in nature or occurred in position players other than pitchers and catchers. Anatomic region injured (shoulder, elbow, forearm, wrist, hand/finger, unspecified upper extremity), position, time missed from game play (defined as number of days missed until return to major or minor league play), and treatments received for injury (conservative versus surgical) were recorded. Injury severity was also tabulated.) An injury was considered mild in severity if a player missed 10 calendar days or less from play, moderate if a player missed 11 to 59 calendar days and severe if a player missed 60 or more calendar days due to injury.

RESULTS:

A total of 145 upper extremity injuries in 2021 and 92 upper extremity injuries in 2019 meeting the inclusion criteria were identified. These injuries were subdivided into anatomical location and severity as seen in Table 1. There was a statistically significant increase in overall injury incidence from 2019 to 2021 ($\chi^2 = 16.5$, $p = 0.001$) as well number of shoulder, and wrist/finger injuries ($\chi^2 = 8.9$, $p = 0.003$) and ($\chi^2 = 5.7$, $p = 0.033$) respectively. A total of 15 surgeries were performed due to upper extremity injuries in MLB players in each of the time periods of interest, as seen in Table 2. Fourteen of these surgeries involved an elbow ulnar collateral ligament (UCL) reconstruction, flexor-pronator repair or arthroscopic elbow surgery in 2021

while 11 of these surgeries were performed in 2019. There was no statistically significant difference in the number of UCL reconstructions performed ($p = 0.066$) or in the severity of injuries seen year to year ($p = 0.515$)

DISCUSSION:

These data indicate that there was a statistically significant increase in overall upper extremity injury incidence in MLB pitchers and catchers as well as an absolute increase in the number of pitchers and catchers undergoing elbow UCL reconstruction following the implementation of the policy to ban foreign substances as compared to pre-policy data from 2019. There are a number of limitations to this study given its retrospective nature. Despite these limitations, we believe these data should cause the MLB to reconsider its strict ban on foreign substances on baseballs given its correlation with increased upper extremity injuries and need for surgery. Our data also support that this policy should not be enacted in other leagues, such as college and minor league baseball, until further studies can be determined to evaluate the link between the foreign substances ban and upper extremity injuries.

REFERENCES:

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