Revisiting the Incidence and Associative Factors for Brachial Plexus Birth Injuries: A 2021-2023 Surveillance Study

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INTRODUCTION:

Prior reports have based the incidence of brachial plexus birth injury (BPBI) on retrospective chart reviews and have been subjected to patients lost to follow-up. By implementing a new, real-time reporting surveillance system to capture patients born at a large, regional healthcare system in the United States, we hypothesize the incidence of BPBI is higher than historically published.

METHODS: To ensure the capture of every BPBI, a comprehensive prospective reporting system was established in obstetric and affiliated tertiary-level neonatal intensive care units (NICU) at two trial sites within the healthcare system. If born at either site, this reporting system ensures patients undergo evaluation by a brachial plexus surgeon at birth and ensures continuous follow-up by a multi-disciplinary brachial plexus team without losses to follow-up ("leakage"). Univariate analysis and chi-squared tests were employed to compare BPBI with demographic data and perinatal clinical outcomes with a significance level set at p < 0.05.

RESULTS: A total of 290 patients were captured by the reporting system between November 2021 and November 2023. The most common triggers for the system were shoulder dystocia (n=269), upper extremity weakness (n=79), macrosomia (n=51), decreased upper extremity reflexes, including Moro (n=30), grasp (n=5), and suck reflexes (n=3), and clavicular (n=15) or humeral fractures (n=6). 98 patients had concurrent brachial plexus symptoms at birth. When accounting

for total number of births, the incidence rate of patients diagnosed with a BPBI at birth was 21.8 per 1,000 live births. Following resolution of symptoms in 77 patients by first follow-up, 21 patients exhibited persistent BPBI symptoms when evaluated at the brachial plexus clinic, resulting in an incidence of 4.7 per 1,000 live births for non-transient BPBI.

DISCUSSION AND CONCLUSION: By prospectively capturing suspected BPBI at birth and ensuring patients were not lost to follow-up, our surveillance system reveals a higher incidence of BPBI than previously reported. This study highlights the need for institutions to implement surveillance mechanisms to properly capture each BPBI for appropriate early intervention.