Assessing and Modeling UTI Infection in Neonates with Hyperbilirubinemia

Team Members:

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Abstract: Hyperbilirubinemia is a condition caused by a buildup of bilirubin in an infant's blood. This buildup can cause jaundice in infants. Research has shown that infants with jaundice can be an early sign of UTI in newborns. This paper aims to address the link between jaundice and UTI for jaundiced infants who require routine treatment. This case control study was conducted on 100 infants(43 male and 57 female) with a gestational age greater than 35 weeks. This study also has 50 matched infants(25 male and 25 female) without hyperbilirubinemia as the control. Urine samples were collected and the presence of Pyuria(greater than 5 white blood cells per high power field) was detected. If pyuria was found in the sample, the sample was cultured to detect bacteria of at least 50,000 CFU per mL of a single urinary pathogen.

Source of dataset: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7891145/

Methodology Proposal:

- Null hypothesis: UTI cases are the same for infants with jaundice and those without
- Alternative hypothesis: UTI cases are not the same for infants with jaundice and those without
- Verify normality of distribution using Kolmogorov-Smirnov Test
- Chi square test for categorical variables to compare treatment and control group. Significance value is 0.05 to compare p values.
- Fisher's exact test to compare treatment and control group of infant data. Significance is at 0.05 to compare p values.
- Monte Carlo test to compare treatment and control of data related to maternal health
- Mann whitney test to compare differences between control and treatment group for abnormally distributed quantitative variables