

THE RESULTS OF LYMPHOCYTE TRANSFORMATION TESTING (LTT) IN KNOWN CASES OF PERIPROSTHETIC JOINT INFECTIONS (PJI)

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CONFLICT OF INTEREST: GERHARD MAALE CONSULTANT TO MICROGENDX FOR THIS STUDY

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INTRODUCTION: PJI'S OCCUR AFTER PRIMARY TOTAL JOINT ARTHROPLASTY (TJA) WITH AN INCIDENCE OF BETWEEN 0.5 -3%. PJI'S WERE DIAGNOSED IN THIS RETROSPECTIVE STUDY GROUP BY THE CONSENSUS CRITERIA 2018 AND 2025. RECENTLY, 16S DNA NEXGEN SEQUENCING (NGS) HAS BEEN ADDED FOR DIAGNOSIS USING THE NIH GENETIC DATA BASE WHICH CONTAINS 56,000 BACTERIAL, VIRAL AND FUNGAL GENETICS IDENTITIES AS THEIR RESISTANCE GENES. SIMILAR, TO PJI PATIENTS WHO OFTEN HAVE IMMUNO-COMPROMISING OR LOCAL COMPROMISING FACTORS, PATIENTS WITH METAL-ION HYPERSENSITIVITIES (MIH) HAVE A DEFECT MEDIATED THROUGH THE LYMPHOCYTES AND HISTIOCYTES CHARACTERISTIC OF A TYPE IV HYPERSENSITIVITY RESPONSE. THE PURPOSE OF THIS STUDY IS TO SEE IF PJI IS MORE COMMON IN PATIENTS PRESENTING WITH MIH.

PJI 'S BY CONSENSUS CRITERIA:



McPherson III-C-3 infected TKR - NGS findings:

Staphylococcus epidermidis

McPherson III-C-3 infected Elbow - NGS findings:

Staphylococcus aureus



McPherson III-C-3 infected TKR - NGS findings:

Streptococcus intermedius, Finegoldia magna, Peptoniphilus coxii, Campylobacter ureolyticus, Anaerococcus prevotii, Peptoniphilus harei



METHODS: IN THIS RETROSPECTIVE STUDY, 91 PATIENTS WITH LTT CONFIRMED MIH BETWEEN 2018 AND 2022 AND DRAINING SINUS TRACT WERE EVALUATED USING NGS OBTAINED FROM DRAINING SINUS TRACTS FROM ASPIRATIONS. ANOTHER GROUP OF 68 PATIENTS WITH PJI'S AND POSITIVE NGS FINDINGS WERE TESTED FOR MIH THROUGH LTT. ALL PATIENTS PRIOR TO ANY SURGICAL INTERVENTION WERE STAGED FOR FOR THE PJI WITH RADIOGRAPHS, TRI-PHASE BONE SCANS, WHITE BLOOD CELL SCANS AND CT SCANS WITH MILLIMETER CUTS OF THE JOINT AND SURROUNDING EFFECTED TISSUE AND JOINTS.

RESULTS: OF THE 91 PATIENTS DIAGNOSED WITH MIH BY LTT SCREENING, 19 WERE DIAGNOSED AND WITH PJI AND HAD ORGANISMS DETECTED WITH NGS (20.88). THIS IS SIGNIFICANTLY GREATER THAN THE PREVALENCE OF PJI IN THE GENERAL POPULATION, 0.73% (73/9973). USING FISHER'S EXACT TEST WITH THIS COMPARISON WAS SIGNIFICANT ($p < .0001$) CONVERSELY 68 PATIENTS DIAGNOSED WITH PJI, 9 PATIENTS TESTED POSITIVE FOR MIH BY LTT. THIS PROPORTION IS SIMILAR TO THE TO THE PREVALENCE OF MIH IN THE GENERAL POPULATION (1.5-11.4%) WITHOUT A STATISTICALLY SIGNIFICANT DIFFERENCE.

- **CONCLUSION:**
- PATIENTS WITH TJA'S COMPLICATED BY MIH SEEM TO HAVE A GREATER INCIDENCE OF PJI'S COMPARED TO THE GENERAL POPULATION.
- THIS MAY INDICATE MIH AS A POTENTIAL RISK FACTOR.
- BASED ON THE ABOVE DATA, LTT SCREENING PRIOR TO REVISION TKA IS WARRANTED.
- THE EXACT RELATIONSHIP BETWEEN MIH AND PJI REMAINS AN AREA FOR FURTHER INVESTIGATION.