

Validation of Spatiotemporal Gait Parameter using Inertial Measurement Unit for Patient with Non-Specific Low Back Pain

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ABSTRACT

Introduction: Gait analysis techniques were widely used in rehabilitation. Gait abnormality observed in patients with severe musculoskeletal disorder such as Low Back Pain (LBP). Currently Inertial Measurement Unit (IMU) showed high consistency instrument for analysing spatiotemporal gait parameter in healthy persons. The aim of this study was to determine the validity and reliability of spatiotemporal gait parameter using the IMU sensor among the non-specific LBP patient. **Methods:** This study involved in two groups of people, LBP group (n = 28; male = 15; female = 13; 41.0±6.9 years old) diagnosed with chronic non-specific LBP recruited from Physiotherapy Department, Hospital Sultanah Aminah, Johor Bahru and healthy adults (n = 28; male = 11; female = 17; 40.9 ±7.4 years old) as control group. Spatiotemporal parameters interested: left and right velocity, cadence and stride/step time recorded by Vicon system and IMU sensors synchronously. **Results:** Higher significant correlation with $p \leq 0.01$ for cadence, velocity, stride and step time for LBP group. The IMU also had shown excellent agreement in between 1st and 2nd trial for LBP group in velocity of shank, foot and lumbar placement of sensor with confidence interval ICC ≥ 0.90 . **Conclusion:** The IMU system performs to be valid and reliable to determine spatiotemporal gait parameters in non-specific LBP patients. IMU provides a possible solution to measure spatiotemporal gait in a clinical setting without requiring specific working area and professional technician.

Percutaneous vs peritoneoscopic placement of peritoneal dialysis catheter: A retrospective study on outcome

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ABSTRACT

Introduction: Uncomplicated placement of peritoneal dialysis catheter (Tenckhoff catheter) is one of the key factors for successful peritoneal dialysis in patients with end stage renal disease (ESRD). Majority of catheter placement in Hospital Raja Perempuan Zainab II (HRPZ II) were done by nephrologists either by percutaneous or peritoneoscopy method. The aim of this study was to compare the catheter outcome and 1 year survival rate between both methods. **Methods:** Data were collected retrospectively on all ESRD patients having Tenckhoff catheters inserted by nephrologists in our centre between January 2015 and June 2018 and fulfilled the study criteria. Statistical analysis executed with SPSS version 21. **Results:** A total of 115 patients fulfilled the selection criteria. Sixty-seven catheters were placed percutaneously and 48 were placed peritoneoscopically. Seven patients developed events within 30 days post Tenckhoff catheter insertion (percutaneous versus peritoneoscopy group; 4(6.0%) versus 3 (6.3%) respectively, p -value=1.000). Within one year post catheter insertion, a total of 51 catheters were removed mainly due to peritonitis (18(35%) versus 9(18%), p -value=0.311) followed by malfunction (9(18%) versus 13(25%), p -value=0.066) and exit site infection (2(4%) versus 0(0%), p -value=0.229). The 1-year survival rate for both percutaneous method and peritoneoscopy method were 56.7% (95% CI: 44.0%, 68.8%) and 54.2% (95% CI: 39.2%, 68.6%) respectively. **Conclusion:** There is no significant difference between percutaneous and peritoneoscopy method of Tenckhoff catheter placement with regard to infectious and mechanical complications as well as 1-year catheter survival rate.