

ABSTRACT

Heel pain is pain caused by excessive pressure such as running and wearing narrow shoes. The pain can get worse when walking or lifting the foot and can even spread to the calf. Several studies of heel pain have been carried out especially related to the diagnosis of the cause of pain. In this study, an analysis of heel pain from signal electromyography (EMG) was carried out using the MDF and RMS feature extraction values of the signal tested on test subjects who had different leg postures. The value of heel pain feature extraction can make it easier to distinguish between the pain experienced. Furthermore, the Nerve Conduction Velocity (NCV) method is used to measure the nerve conduction velocity at the time of heel pain testing when the test subject's condition has finished doing the activity and to obtain differences in the value of normal nerve conduction velocities and those with heel pain. HPF butterworth second order and 8th order butterworth LPF filters are used in the heel pain detection system in the frequency range 50 - 400 Hz.

The result of this study is a heel pain detection system using EMG signals, where the RMS feature extraction value is 3.5-4 times more sensitive than the MDF feature where the pronated leg posture is more significant in pain than normal leg posture. In the NCV measurement, the nerve conduction velocity slows down after activity, which is an average of 38.45 m/s, from the pre-activity condition where the average nerve conduction velocity is 42.64 m/s. This is because the muscles experience pain so that the performance of the nerves becomes disturbed or tired which results in a long nerve latency when it comes to resting time.

Keywords : *Heel Pain, Electromyography, Nerve Conduction Velocity, Leg Posture*