Abstract: Analysis of the complexity and variability from the biomedical physiological time series data raises significant interest as a promising and sensitive marker of abnormality or impairment assessment in muscle physiology, especially in electromyography (EMG) signal. This paper aimed to measure subject-specific (i.e., individual) fractal dimension as a quantitative measure of complexity of EMG signal (i.e., detecting long-range correlations in noisy signal) from upper limb bicep brachii (BB) muscle during five elbow joint angles movement (at 0°, 30°, 60°, 90° and 120°). The EMG signal was recorded from ten healthy (mean±SD age: 22.4±1.5 years) participants using wearable sensor. The fractal scaling (α-values) of the EMG time series was assessed using a non-linear technique called detrended fluctuation analysis (DFA). Majority of the results show that DFA α-values at each angle exhibit anti-correlated (i.e., DFA α < 0.05) behavior. Few results show positive correlation (i.e., DFA α between 0.53 to 0.77), but none of the α values have 1.0 (strongly correlated/pink noise). No significant difference exits between the elbow angles except one case, i.e., 0° vs. 30° (p < 0.05). This DFA-based complexity measuring results from EMG signal holds promise for rehabilitation of control of upper limb muscle activation patterns.