

Electrocardiographic alterations by pneumothorax: a case-control study with review of the literature

Bruno Minotti, Roman Brenner, Lotus May Desbiolles, Joseph Osterwalder, Otto Schoch & Peter Ammann

BACKGROUND: Numerous ECG alterations due to pneumothorax have been reported. The objective of the study was to establish the presence of ECG changes associated with pneumothorax in the literature, and in a cohort of patients with proven pneumothorax compared with age- and sex-matched healthy controls.

METHODS: A systematic review for ECG alterations associated with pneumothorax was performed. We then reviewed our hospital database for patients with pneumothorax and identified all patients with an ECG available at this time. The retrieved ECG alterations in the systematic review were identified in our pneumothorax patients and compared with a healthy sex- and age-matched control group. Accordingly, we calculated sensitivity and specificity for all alterations.

RESULTS: Seventeen ECG alterations were found and defined from the systematic review. Our pneumothorax cohort consisted of 82 pneumothorax patients and 82 control patients. Specificity was mostly more than 90%, but sensitivities were low. Phasic R voltage (pneumothorax group 25.6% vs control group 1.2%), T-wave inversion (31.7% vs 2.4%), prolonged QTc (11.0% vs 2.4%), right axis deviation (14.6% vs 3.6%) and QRS voltage ratio in aVF/I > 2 (41.5% vs 22.0%) were significantly more frequent in pneumothorax patients compared with controls.

CONCLUSION: The sensitivity of published ECG signs in predicting pneumothorax in our cohort was low, which means that ECG findings are an unsuitable tool for pneumothorax screening. However, presence of these ECG signs might raise a suspicion of pneumothorax in patients presenting with dyspnoea, or unclear chest discomfort.

type	journal paper/review (English)
date of publishing	3-8-2021
journal title	Swiss Medical Weekly (151/w30041)