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Editorial

The wireless revolution and cardiorespiratory system monitoring☆

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In recent years the rapid development of smart phones, mobile connectivity and social networks has raised a digital revolution and changed the way of life. Medicine has adopted this way of transforming wirelessly medical data and a new season of medical care has been revealed. New sophisticated algorithms have been used to monitor patients, especially those who suffer from cardiorespiratory diseases [1].

Ambulatory Holter devices for ECG monitoring allows accurate diagnosis of several cardiac diseases, especially cardiac arrhythmias [2]. Additionally, they offer very useful prognostic information grading the severity of cardiac disease and guiding therapy [2]. On the other hand, respiratory Holter monitoring also allows an accurate screening for obstructive and central sleep apneas (OSA/CSA) at a patient's own home, defined as sleep disordered breathing [3].

Previously has been reported the relationship between increased premature ventricular contractions (PVC) and higher apnea-hypopnea index (AHI), both of which were associated with increased mortality and morbidity especially from myocardial infarction [3]. Furthermore Cheyne–Stokes breathing (periodic oscillation between hyperpnea, hypopnea, and apnea) is very common among patients with chronic heart failure [3]. Additionally in patients with heart failure telemonitoring helped in reduction of mortality and of the number of hospitalizations [4].

Currently, Haigney et al. have described that polysomnography is the gold standard method for the diagnosis of OSA/CSA; however at a considerably high cost [3]. Wearable technology using Holter-derived respiration (HDR) is a relatively new method of telemonitoring which combines 24-hour Holter monitoring to acquire ECG derived respiration [3]. Wearable devices for ECG and respiratory Holter monitoring have been proposed as sensitive and inexpensive methods for the diagnosis of sleep-disordered breathing in patients with heart diseases [3,5].

Wearable devices used as a chest strap with ECG monitor and several respiratory sensors [4–6]. Important markers of respiratory and cardiac function are estimated simultaneously: respiratory rate, inspiratory time, relative changes of tidal volume, SpO2, episodes of Cheyne–Stokes respiration per 24-hour period, heart rate, P wave, QRS complex and ST segment or PR interval, QT interval, RR interval, R-wave amplitude and T-wave amplitude as well [3–6].

Telemonitoring with wearable devices for ECG and respiratory Holter monitoring appears as a promising method of cardiorespiratory evaluation in patients with heart diseases [3,5]. Especially, in patients with heart failure telemonitoring helped in reduction mortality and the number of hospitalizations [5]. Large amounts of data may arise in providing a better and holistic approach to the patient's condition [4,6]. To support the extremely important finding of the accurate continuous monitoring of cardiorespiratory signals during the 24 h and the possible prognostic value of the cardiac and respiratory markers obtained by Holter devices, it would be interesting and clinically meaningful to know whether these markers are associated with morbidity, mortality or sudden cardiac death (SCD).

Conflict of interest

The authors report no relationships that could be construed as a conflict of interest.

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