Filling the gap in the detection and management of dysrhythmia

Fernández Rodríguez S.¹, Haas N. A.¹, Lehner A.¹, Birnbaum J.¹, Fischer M.¹, Schulze-Neick I.¹

¹Ludwig-Maximilians-University, Campus Großhadern, Department of Pediatric Cardiology and Pediatric Intensive Care, München, Germany

Introduction:
Palpitations and syncope are frequent possible symptoms of dysrhythmias in pediatric patients and in patients with congenital heart diseases. The precise diagnosis can be influenced by a number of factors: non-compliance, rare occurrence and short duration of the dysrhythmia. With the standard holter ECG there is only the option of 24-48-hour monitoring of the patient. The standard holter are only partly usable to clarify unexplained episodes of dizziness, near syncope and syncope in heart-healthy children because of their limited recording time and the often rare occurrence of symptoms. Event monitors who require a activation of the patient are not practicable for young patients and are also useless in children with syncope. Implantable event monitors however are invasive and expensive procedures. To date there are not many possibilities to make a longer monitoring up to 60 days with a 3-channel ECG. (Fig. 1)

Conclusion:
The cordless ECG from nuubo® is a helpful diagnostic tool for patients with suspected rhythm disorders covering a wide age and size range. The monitored period was adapted to individual patients needs. The cordless ECG showed impressive signal quality and precise detection of arrhythmias.

Results:
The long-term ECG monitoring showed an excellent signal quality in all patients; 84 % available in analyzable form. No patient prematurely stopped the long-term ECG. Even patients with massive scoliosis, dextrocardia and other complicating circumstances such as patient compliance reached a good signal quality. (Fig. 5) In 4 patients dysrhythmia were detected which required a therapy adjustment. (Fig. 7) These periods of dysrhythmia were of short duration and did not happen every day so that it might have stayed undetected with a standard holter ECG. 3 patients showed no changes in their known dysrhythmia and 8 patients showed normal ECG in rare episodes of palpitation or syncope. All the patients would choose to wear the nuubo ® system again. (Fig. 8)

Methods:
We used the 3-channel cordless ECG from nuubo® (Fig. 2) in 15 consecutive patients and assessed the feasibility and accuracy. The cordless ECG consist of a vest with 5 or 6 stretchable silver electrodes (Fig. 3) and a minder as recording device. The minder has a micro SD card for the storage of the data and an accelerometer, who determines the activity index of the patient and his body position. (Fig. 4)

E-Mail: Silvia.Fernandez_Rodriguez@med.uni-muenchen.de

In addition questionnaire regarding patient comfort was used. Diagnostic investigation were indicated because of palpitations, syncope, previous history of dysrhythmia with new symptoms and for therapy monitoring. The average period of monitoring was 9.0 days (5-21 days). The median age was 22 years (1-61 years).

Conclusion:
The cordless ECG from nuubo® is a helpful diagnostic tool for patients with suspected rhythm disorders covering a wide age and size range. The monitored period was adapted to individual patients needs. The cordless ECG showed impressive signal quality and precise detection of arrhythmias.