



EDITORIAL

## Paediatric arrhythmology: a challenge of the 21st century<sup>☆</sup>



### Arritmología pediátrica, el reto del siglo XXI

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Arrhythmias are disorders of the heart rhythm that are infrequent in the paediatric age group, and may present as tachycardia or bradycardia.

In the current issue of *Anales de Pediatría*, Roguera et al.<sup>1</sup> describe 2 cases of paroxysmal atrial fibrillation in children and reviewed the literature on this condition. Atrial fibrillation is the most frequent arrhythmia in the total population and is most prevalent in the geriatric age group. It is very rare in children, especially those with a structurally normal heart. When it occurs in very young children, it usually has a genetic aetiology, and therefore comprehensive genetic testing of the family is highly advisable in these cases. In older children, the cause is usually excess weight, and in young adults the intense level of physical activity associated with competitive sports. Early detection is key to prevent the complications of atrial fibrillation.<sup>2</sup>

Tachycardia usually presents with intermittent palpitations of short duration, and since these symptoms are highly

nonspecific, the actual diagnosis of arrhythmia may be delayed for months or even years. This is why the training of paediatricians in the detection of signs and symptoms that may alert to the presence of arrhythmias is of utmost importance for the purpose of preventing the potential complications of tachycardia (heart failure or sudden death) or bradycardia (syncope).<sup>3</sup> Current technology offers multiple tools that facilitate diagnosis: watches, small adhesive devices, smart tissues. Through the wireless transmission of data, all of them allow remote monitoring from anywhere on the globe.<sup>4</sup>

Tachycardias can be treated with drugs that usually require compounding to achieve the dose required for the body weight of paediatric patients. These treatments are not curative and allow the control of tachycardia until, if necessary, the definitive curative treatment, cardiac ablation, can be performed. Cardiac ablation is a minimally invasive procedure that is usually performed with a percutaneous approach (through direct femoral puncture), advancing 1 or 2 catheters to the heart. The source of the tachycardia can be identified through the catheter and eliminated with the delivery of radiofrequency energy (heat) or cryotherapy (cold). Some tachycardias are very complex and require three-dimensional mapping and navigation systems to identify the source for subsequent elimination. Although

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for the most part the same methods are being used for treatment of arrhythmias, the introduction of image integration is facilitating the location of sources of arrhythmia in cases with structural abnormalities, in cardiac surgery and in complex substrates. Nevertheless, some forms of tachycardia, especially those caused by channelopathies or other genetic disorders, cannot be cured by catheter ablation and require placement of a defibrillator to prevent potentially severe complications. The information provided by genetic testing is essential in these disorders, as it allows delivery of optimal individualised treatment.<sup>4</sup> Lastly, when treatment is required in bradycardias, it usually involves placement of devices to control the heart rate, such as pacemakers.<sup>5</sup>

Despite the armamentarium currently available for the management of arrhythmias, there are hardly any tools designed specifically for the paediatric population. As is the case in many other paediatric specialities, the therapeutic tools commonly used in the management of our youngest patients are originally developed for adults and need to be adapted by each individual care facility.

Due to the complexity of the substrate and the very specific characteristics of this disorder, the Spanish Ministry of Health proposed the establishment of the Paediatric Electrophysiology speciality within the framework of the Reference Centres, Departments and Units programme (Centros Servicios y Unidades de Referencia, CSUR), underscoring that cardiac ablation for treatment of paediatric arrhythmias is very complex and has a steep learning curve that requires adequate experience in settings devoted to this activity to ensure optimal outcomes and patient safety.

For years, scientific societies focused on paediatric specialities (Sociedad Española de Cardiología Pediátrica

[Spanish Society of Paediatric Cardiology], Association for European Paediatric Cardiology, American Academy of Pediatrics) have sections devoted to heart rhythm problems. These multidisciplinary and multicentre working groups offer various educational activities on an ongoing basis with the aim of delivering this specialised knowledge to paediatricians, cardiologists, family physicians and other health care staff. The growing interest in this subspecialty is evinced by the numerous courses and workshops on the subject organised in Spain.

In any case, paediatric arrhythmology is still a developing field rife with challenges and with many areas in need of exploration, which makes it a very attractive subspecialty for upcoming generations.

## References

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