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Jan Misugi in Captain Tsubasa as an Educational Example for Children with Congenital Heart Disease

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Abstract: Introduction: Visual narratives such as manga, comics and cartoons can play an important role in educating readers on various aspects of life including medicine and disabilities. **Methods:** We reviewed the animated series entitled *"Captain Tsubasa",* focusing our analysis on the episodes which introduced the character Jun Misugi, a football player suffering from an unspecified congenital heart disease (CHD). **Discussion:** For a child with a CHD, the practice of sports could be risky but also an opportunity to improve heart function and reach personal fulfillment. CHD have an important impact on children's quality of life, and sports participation has beneficial effects on quality of life, weight loss, and exercise capacity, in patients with CHD. Restricting sports could have a negative impact on quality of life, and on the disease acceptance in children with CHD. The story of Jan Misugi could be considered as an educational medical tool to sensitize children with CHD who face sport' restriction.

Keywords: Congenital heart disease; cartoons; medical humanities

1 Introduction

Visual narratives such as manga, comics and cartoons are useful tools for communication and education. They make messages more accessible for the audience and can engage children and teenagers. Topics such as medicine and disabilities have already been addressed in graphic novels [1–3].

2 Objective

This paper focuses on the manga (Japanese graphic novel) series entitled *"Captain Tsubasa"* revolving around soccer and how it can carry important educative and prevention messages regarding the practice of sports for children with congenital heart diseases (CHD), and help to improve patient-physician relationship.

3 Methods

We analyzed the cartoons series entitled *"Captain Tsubasa", trough* a secondary protagonist, Jun Misugi, a football player suffering from an unspecified CHD.

4 Setting

Created as a manga series in 1981, and adapted into a TV anime that premiered in Japan in 1983, *"Captain Tsubasa"* successfully spread in the eighties in Europe, USA, Latin America, and Arabic Countries. A secondary character, named Jun Misugi, is a gifted midfielder and captain of Tokyo's football

team. He suffered from an unspecified CHD that prevents him to play with full strength a complete game (episode 35). During a critical game between his team and Tsubasa's (episodes 35–37), Jun Misugi chooses to play the entire game in a difficult weather, so he undergoes a more intense physical stress. Due to his CHD, he has a poor tolerance to physical effort; indeed, he cannot play for more than 10 minutes without reporting fatigue, and after an effort he seems very fatigued. Moreover, he sometimes seems to refer to fatigue, weakness, chest pain (angina), discomfort or tightness, during exercise; indeed, during the effort, Jun hold several times during the game his closed hand over the chest, typical of *Levine's sign*, a clenched fist held over the chest, favoring angina pectoris. At the end of the football match, Jun Misugi has to leave the game with the help of a friend but faints (Episode 37). He is admitted at the Hospital, and undergoes cardiac surgery. In a sequel series entitled "*Captain Tsubasa World Youth*", we learn that Misugi's surgery definitively solved his heart disease. He came back to play to football, and started studying medicine to help other athletes suffering from health problems.

5 Discussion

Several teachings may be taken from the history of Jun Misugi, which explores many features of the complex relationship between CHD and sports in children. First, it highlights the importance of an accurate medical screening, before starting, and during the agonist activity in young athletes. For a child with a cardiac condition, the practice of sports could be considered as a source of risk but also represents an opportunity to improve heart function and personal fulfillment [4]. Consensus statements from the U.S. and Europe [5–7] promoted physical activity in patients with CHD.

CHD has an important impact on children's quality of life [8], and sports participation, even at high levels, has beneficial effects on quality of life, BMI, and exercise capacity, in patients with CHD [9]. So, sports restrictions could have a negative impact on quality of life, and on the disease acceptance in children with CHD.

In this respect, the character of Jun Misugi is illustrative. The impact of his CHD during his childhood is emphasized in episode 37. We learn that as a child, he was so fragile that he was not allowed to play in the garden and as he was a single child, he was lonely. He was also discouraged by doctors to play his passion, soccer. However, he denied his diagnosis and pretended to his parents he was fine. Diagnosis can be denied and even ignored by young athletes despite life-threatening risks [8]. However, Misugi did not totally deny his condition. He took limitation in his strides. He compensated his physical disabilities by sparing himself and choosing not to play all the time with agreement with his trainer, he developed a great tactical sense, which allowed him to direct the game also from the bench, in particular through the organization and application of the offside. After leaving the field, his team as well as opponents showed concern, peer support and respect for him. Despite difficulties, parents were supportive as well. Lastly, he benefited from a cardiac intervention, that allowed him to practice again but also to gain maturity. On the other hand, what happened to Misugi on the field acts as a reminder of the risk despite some children may feel well.

The story of Jan Misugi as anime manga maybe useful to sensitize children with CHD that face sports restriction. It illustrates in a few episodes various experiences that children with CHD might face, and therefore can be used as an educational tool during consultation and follow-up.

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