

## **Bee stings in children: not always benign**

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### **Abstract:**

*Bee sting is often limited to local reactions which most of the time do not require medical treatment. However, in some cases these reactions are general and can be life threatening. We report the observation of a young 9-year-old child from rural areas, until then in good health, having been the victim two weeks before his admission, of a sting by a swarm of bees, and who presented a complete ear block afterwards. We are trying through this work to report a serious complication rarely described in the literature and also to remind practitioners of the main possible reactions in children as well as their evolution and immediate management.*

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### **I. Introduction:**

The bee occupies a preponderant place in the plant world and represents a source of benefits for humans. Its beekeeping products are of great use in food, cosmetics or therapy. However, bee stings can cause serious immunological and / or toxic events that can endanger the life-threatening prognosis of patients.

In this work, we report the observation of a 9-year-old child who presented with a cardiovascular complication such as atrioventricular block after a bite by a swarm of insects.

### **II. Observation:**

This is a 9-year-old child from a rural area, the last of a sibling of 3, of non-consanguineous parents with no notable pathological history admitted to the emergency room for a clinical picture consisting of vomiting and acute headache. Clinical examination found abdominal tenderness, cardiac frequency = 45 beats per minute, respiratory rate= 30cpm, blood pressure 10/05 Mercury centimeter.

In emergency, the child received an emergency electrocardiogram which revealed sinus bradycardia (Figure n°1).

In the history, there is no notion of taking a toxicant, the child shows no signs of infection, nor signs of heart failure; on the body, we note the presence of lesions on the face and limbs (Figure n ° 2), described as stings by a swarm of bees dating back to 2 weeks since the father is a beekeeper, having caused edema of the face and lips initially, a symptomatology which subsequently disappeared.

A biological and infectious test is normal, cardiac echocardiography is normal, with a holter ECG records atrioventricular block. At this stage, the hypothesis of a cardiac rhythm disorder post bee sting is mentioned, the rate of CPK is slightly increased.

At first, symptomatic treatment is administered, an Holter ECG is proposed and the evolution is marked by the resumption of a normal heart rate after ten days which testifies to the inaugurality of the arrhythmia and especially its reversibility. (Figure n ° 3)

### **III. Discussion:**

The reactions that our body develops following a bee sting may be due to a non-immunological mechanism (normal and toxic reaction) or to an immunological mechanism of the allergic type. These reactions can be local or generalized. Pseudo-allergic accidents can also occur [1].

It is noted that the allergic reaction can be triggered by a single bite, and the higher the number of bites, the worse the prognosis because several bites result in the inoculation of a greater quantity of venom with the

toxic substances it contains, in particular: Mellitin, Phospholipase A2, Hyaluronidase and Apamine. Mellitin, specific to bees [2].

Immediately after massive bites, the signs are local (pain, sweating, erythema). In parallel, early systemic signs appear (asthenia, nausea, vomiting and diarrhea). After a few hours, hemolysis, hemoglobinuria, rhabdomyolysis and hepatic cytolysis may develop. Neuroencephalic and cardiac damage are rarer. Often acute renal damage is linked to direct toxicity of the venom to the tubules, prolonged hypovolemia, or tubulopathy secondary to myoglobinuria and hemoglobinuria [3]

Through the review of the literature, the cardiovascular complications described are mainly of the type repolarization disorders (Sus shift, ST segment shift, negative T waves, hyper acute T) or more rarely conduction disorders (atrial flutter, block branch [4-7])

The originality of our observation is the occurrence of a heart complication such as atrioventricular block in children. Similar to our observation and for the first time, an Indian team described the occurrence of a cardiovascular complication such as complete atrioventricular block in a 55-year-old after a sting by a 50 bee groin, this complication having occurred 3 weeks after the 'incident and requiring the installation of an emergency pacemaker [8].

The etiopathogenesis of this complication can have two hypotheses:

-the first, through the occurrence of Kounis syndrome which was first described in 1991 as an acute allergic coronary syndrome (insect bite, consumption of allergenic foods, drug intake). According to this hypothesis, the occurrence of coronary damage is mainly due to systemic vasodilation and a decrease in venous return secondary to increased vascular permeability following anaphylaxis [9].

-The second hypothesis is to link the occurrence of cardiac complication to substances contained in the nectar of a flower consumed by bees called rhododendrons or azaleas, a flower that contains grayanotoxins, known to slow the heart rate [8].

It should be noted that a conduction disorder such as complete atrioventricular block after hymenoptera sting has not been reported in children before our case report.

The prognosis for cardiac involvement depends first and foremost on the patient's history, including coronary artery disease, the time to onset of the disorder compared to the bite and also the type of disorder observed. Cases of recovery from cardiovascular complications have been reported [7]. In addition to standard symptomatic management (elevation of the limbs, application of cold compresses, administration of a nonsteroidal anti-inflammatory drug and corticosteroids in case of angioedema, injection of adrenaline in the event of anaphylactic shock.), the treatment of cardiac complications is discussed from patient to patient and depends on the type and severity of the attack and also reversibility of the disorder, it can be symptomatic (hydrocortisone, Anticoagulant) or interventional (pacemaker, angiography with stenting) [3-6]. In all cases, the patient must be kept under observation for at least six hours after a moderate episode and 24 hours after a severe episode, given the two-phase evolution of anaphylactic reactions which can re-establish after six hours [10]

In our case, the indication of a pacemaker was initially discussed and then deferred before the normalization of the heart rate.

#### **IV. Conclusion:**


Bee sting is not always benign, our observation illustrates a complication that is certainly rare but can be serious in children. Hence the interest of insisting on preventive measures for subjects at risk (rural areas, beekeepers, etc.) or during outings organized by schools.

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#### **Bibliography:**

- [1]. Navarro LA, Peláez A, de la Torre F et al. Epidemiological factors on Hymenoptera venom Allergy in a Spanish adult population. *J Investig Allergol Clin Immunol.* 2004;14:134-41.
- [2]. De Lima, P. R.; Brochetto-Braga, M. R. Hymenoptera Venom Review Focusing on *Apis mellifera*. *J. Venom Anim. Toxins Trop. Dis.* 2003, 9, 149–162
- [3]. E.K. Kouamé \*, Y. Brouh, N. Boua. Envenimation massive par un essaim d'abeilles chez un nourrisson *Archives de pédiatrie* 11 (2004) 1333–1335
- [4]. Law DA, Beto RJ, Dulaney J, and al. Atrial flutter and fibrillation following bee stings. *Am J Cardiol* 1997;80:1255.
- [5]. Weeranun Dechyapirom, Cihan Cevik □, Kenneth Nugent. Concurrent acute coronary syndrome and ischemic stroke following multiple bee stings. *International Journal of Cardiology* 151 (2011) e47–e52
- [6]. Erbilin E, Gulcan E, Albayrak S and al. Acute myocardial infarction due to a bee sting manifested with ST wave elevation after hospital admission. *South Med J* 2008;101:44
- [7]. Taggar JS, Watson T, Musarrat K and al. Kounis syndrome presenting as ST- segment elevation myocardial infarction following a hymenoptera (bee) sting. *Int J Cardiol* 2009;136:e29–30.

- [8]. Gupta PN, Kumar BK, Velappan P, *et al* Possible complication of bee stings and a review of the cardiac effects of bee stings *Case Reports* 2016;2016:bcr2015213974.
- [9]. Sarfaraz Memon, MD,  Lovely Chhabra, MD, Shihab Masrur and al Allergic acute coronary syndrome (Kounis syndrome) *Proc (Bayl Univ Med Cent)*. 2015 Jul; 28(3): 358–362. doi: 10.1080/08998280.2015.11929274
- [10]. Kemp ED. Bites and stings of the arthropod kind. *Postgrad Med* 1998;103(6):88-105

Figures:

**Figure n°1:** Complete atrioventricular block on admission ECG



**Figure n°2:** presence of insect bite lesions after two weeks on the child's face



**Figure n° 3 :** normalization of the heart rate after 2 weeks in our patient

