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Age distribution of acute respiratory infections caused by enteroviruses in the child population[☆]



Distribución etaria de las infecciones respiratorias agudas causadas por los enterovirus en la población infantil

Dear Editor,

Acute respiratory infections (ARI) are an entity that primarily affects the child patient population. Out of all the different viruses involved here, the enteroviruses (EV) have been reported to have an incidence of 3–7 per cent.^{1,2} EVs are transmitted through the fecal-oral route, and they can be sporadic or community outbreaks. We attribute them their etiologic participation in the ARIs of the upper (rhinitis and pharyngitis) and lower respiratory tracts (bronchiolitis, bronchitis, and pneumonia).^{1–3}

Although their preference for child age is widely known (<15 years old) probably due to their scant immunity, there are very few studies establishing a correlation between age of presentation and type of EV found.^{4–6}

We hereby present a retrospective study on the age distribution of ARIs due to EVs in the child patient population in the Balearic Islands, Spain. During the study period, November 2015 through June 2016, one respiratory sample was collected from all children presenting to the ER with clinical suspicion of ARI.

Viral detection took place using one real time RT-PCR genomic amplification technique capable of detecting both simultaneously and differentially 16 different types of viruses (Allplex[®] Respiratory Full Panel Assay; Seegen, South Korea). This technique allows us to distinguish between enteroviruses and rhinoviruses, but it won't help typing the different kinds of enteroviruses that exist. The samples that tested positive for enterovirus were taken to the National Center of Microbiology (Madrid, Spain) for the ultimate typing process.

Across the study 2754 samples were analyzed, out of which 1461 (53 per cent) tested positive. In this period, we found 115 cases of ARIs due to EV, which amounts to 4.1 per cent of all the samples collected, and 7.8 per cent of the ones that tested positive. The *Echovirus* was responsible for 17.3 per cent of the infections, the

Coxsackievirus type A of 33 per cent of the ARIs, the *Coxsackievirus* type B of 9.5 per cent, the EV-D68 of 33 per cent of the infections, and the EV-A71 of 6.9 per cent of all the ARIs (Table 1). Twenty (20) different types of viruses were found being the following ones the most common of all: EV-D68 (38 cases – 33 per cent), *Coxsackievirus* A6 (14 cases – 12.1 per cent), EV-A71 (8 cases – 6.9 per cent), and *Coxsackievirus* A10 (8 cases – 6.9 per cent).

The patients' main clinical presentations were: cold (44.3 per cent); bronchiolitis (20 per cent); pharyngotonsillitis (10.5 per cent); bronchitis (9.5 per cent); bronchospasm (9.5 per cent); and pneumonia (6 per cent).

22.6 per cent of the cases debuted <6 months old, 55.6 per cent >1 year old, and 75.6 per cent <2 years old (Table 1). Fifteen (15) cases were found in the neonatal stage, most of them due to *Echovirus* and EV-D68. Fifty-three (53) per cent of the cases were found between 6 and 24 months old. Sixty (60) per cent of *Echoviruses* were found <6 months old, 50 per cent of *Coxsackieviruses* type A between 6 and 12 months old, 45.4 per cent of *Coxsackieviruses* type B between 6 and 12 months old, 50 per cent of EV-D68 <12 months old, and 50 per cent of EV-A71 between 6 and 12 months old.

The average age of patients with *Echovirus* was 12.7 months old (range: 17 days–4 years), the average age of those with *Coxsackievirus* type A, 21.5 months old (range: 14 days–5 years), the average age of patients with *Coxsackievirus* type B, 30.8 months old (range: 1 month–9 years), that of patients with EV-D68, 32.4 months old (range: 1 month–9 years), and the average age of patients with EV-A71, 17 months old (range: 5 months–3 years).

We were able to confirm that *Echoviruses* are predominant during the neonatal stage and in patients under 6 months old. How-

Table 1
Age distribution of respiratory infections due to enterovirus.

	Echo	CoxA	CoxB	D68	A71	Total
<1 m	8 (53.3) ^a	1 (6.6)	1 (6.6)	5 (33.3)	0	15 (13)
1–6 m	4 (36.3)	0	0	6 (54.5)	1 (9)	11 (9.5)
6–12 m	2 (5.2)	19 (50)	5 (13.1)	8 (21)	4 (10.5)	38 (33)
12–24 m	2 (8.6)	10 (43.4)	2 (8.6)	7 (30.4)	2 (8.6)	23 (20)
2–4 a	4 (23.5)	6 (35.2)	1 (5.8)	5 (29.4)	1 (5.8)	17 (14.7)
>4 a	0	2 (18.1)	2 (18.1)	7 (63.6)	0	11 (9.5)
	20 (17.3)	38 (33)	11 (9.5)	38 (33)	8 (6.9)	115

Echo: *Echovirus*; CoxA: *Coxsackievirus* type A; CoxB: *Coxsackievirus* type B; D68: EV-D68; A71: EV-A71.

^a Number of cases (percentage on the total number of cases).

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ever, both types of *Coxsackieviruses* were predominant in patients between 6 and 24 months old (31.3 per cent).

The predominance of a given EV in the different age groups varies depending on the circulation of such virus. Thus, in the period that goes from 2010 to 2013, in our country, most neonatal infections were due to *Coxsackievirus* type A (83 per cent),⁴ but today it seems that the predominant viruses are different types of *Echoviruses*.

Also, the EV-D68 is the most highly detected virus in patients under 6 months old (54.5 per cent), although very homogeneous distributions have been confirmed in the remaining ages. However, something consistent with other studies⁷ is the fact that this virus has been the predominant virus in patients >5 years old (63.6 per cent). Unlike other studies,⁸ when it comes to EV-A71, 62.5 per cent of the patients were <1 year old.

We have been able to confirm that EVs preferably affect patients under 15 years old because in this same period we confirmed three (3) cases in adult patients only. This is why we should take their participation into account not only in the ARIs of these patients, but in most fever syndromes without a focus. The distribution of the different types of viruses shows a certain preference for certain age segments, specially *Echoviruses*.

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Infective endocarditis due to *Lactobacillus rhamnosus*: Risks of probiotic consumption in a patient with structural heart disease[☆]



Endocarditis infecciosa por *Lactobacillus rhamnosus*: riesgos del consumo de probióticos en un paciente con cardiopatía estructural

Lactobacillus includes one heterogeneous group of gram-positive, microaerophilic, non-sporulating, catalase-negative bacilli.¹ They are part of the common bacterial flora within the oral cavity, the GI tract, and the genitourinary apparatus.² Its isolation in clinical samples usually goes unnoticed due to its special nutritional requirements; long periods of incubation; and inadequate identifications through conventional systems.³ In most cases, they are usually regarded as contaminants; however, their participation in serious infections such as bacteremia, and endocarditis, especially in hosts with certain comorbidities has often been reported.^{3,4}

We hereby present the case of a twenty-eight (28) year old male who was referred to our hospital for the surgical assessment of an aortic valve endocarditis. His personal history showed the presence of one bicuspid aortic valve. He presented to his hospital emergency room a 10-day history of fever and dyspnea. Upon his arrival, hemocultures were collected and one transthoracic echocardiogram was performed that showed the thickening of his bicuspid aortic valve, and a 5 × 7 mm image of mobile nodules confirmed the presence

of vegetation and severe aortic failure. Empirical antibiotic therapy with ampicillin, cloxacillin, and ceftriaxone was started. Since the patient's heart failure was getting worse and his fever persisted even after 72 h of antibiotic treatment, the patient was referred to our center. After hospital admission, three (3) new sets of hemocultures were collected and the patient's valve was replaced by one biological device. All hemocultures obtained in our center tested positive 48–72 h after incubation even though the patient was receiving antibiotic treatment.

The Gram staining revealed the presence of one gram-positive, non-sporulating bacillus (Fig. 1) that was isolated in both blood agar and chocolate agar after 48 h of incubation under aerobic and anaerobic conditions. Alpha-hemolytic and catalase-negative colonies were seen in pure cultures. Using the MALDI-TOF MS analysis (Bruker Daltonics, Bremen, Germany) the *Lactobacillus rhamnosus* bacteria was isolated (score: 2.18). Eventually, the 16S ARNr gene was sequenced showing 99 per cent homology with *L. rhamnosus* (GenBank: CP016823.1). The surgical material of the heart valve showed presence of *L. rhamnosus* bacteria too. Also, the reference hospital confirmed growth of *L. rhamnosus* in the hemocultures.

One antibiogram was conducted using the E-test method, and the minimal inhibitory concentration (MIC) was interpreted based on the recommendations established by EUCAST. The strain was sensitive to penicillin (MIC 0.25 µg/ml); amoxicillin-clavulanic acid (MIC 0.75 µg/ml); imipenem (MIC 0.75 µg/ml); and clindamycin (MIC 0.047 µg/ml). Once the microbiological results were available, a course of treatment with ampicillin (2 g/4 h), and gentamicin (240 mg/24 h) was started and it went on for another six (6) weeks. The patient was interrogated in search for any predisposing factors of lactobacilli endocarditis; the patient denied having any recent dental procedures done, but confirmed the daily use of probiotic products enriched with *Lactobacillus*.

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