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Tourist pediatric morbidity during their visit to Split-Dalmatia County

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The aim was to determine morbidity of foreign children during their tourist visit to Split-Dalmatia County, Croatia. The study included medical documentation of 233 foreign children tourists aged under 18 years, hospitalized at Clinical Department of Pediatrics, Split University Hospital Center in the period from January 2007 to December 2013. Demographic data were statistically analyzed. Of 233 children tourists hospitalized at our department, 134 (57.5%) were boys. Most of the children tourists (51.1%) were aged 0-5 years. According to nationality, they were from 30 countries from all over the world, but mostly from Europe (97.9%). The highest number of children tourists were from Germany (14.2%). The highest percentage of children tourists (92.7%) were hospitalized during summer months. The mean length of hospital stay was 4.4±3.3 days. According to the reason for hospitalization, children tourists were mostly admitted to our hospital for nervous system symptoms (32.6%); 43.4% of these had febrile seizures and 39.5% epilepsy. The nervous system symptoms were followed by injury and poisoning (14.6%), respiratory symptoms (14.1%), submersion and heat injuries (9.9%), and digestive symptoms (9.4%). In conclusion, we describe foreign pediatric population hospitalized in the Split University Hospital Center during their vacation in the Split-Dalmatia County, Croatia. The largest number of children tourists were from Germany and the nervous system symptoms were the most common reason for hospitalization. Therefore, we suggest cooperation between the Croatian health care system and Croatian National Tourist Board for developing prevention strategies regarding morbidity in pediatric tourist population. In particular, prevention and first line therapy for cerebral seizures should be broadly available, such as in hotels, apartments, and even on beaches.

Keywords: morbidity; pediatrics

INTRODUCTION

Croatia is a popular tourist destination and is placed among the 30 most desirable tourist destinations in the world. The number of foreign tourists visiting Croatia is rising constantly, from 8 467 000 in 2005 to 10 955 000 in 2013 (1). The turists mostly come during summer months (2, 3), from May until September, with the peak during July and August (4). During their stay, tourists need medical care for various reasons.

In the literature, tourist morbidity while staying abroad is not extensively described. The aim of this study was to get more information regarding morbidity of foreign pediatric patients visiting Split-Dalmatia County. In addition, knowing the morbidity of children tourists may help in developing prevention strategies for this population and improve their vacation in our country.

SUBJECTS AND METHODS

Our research was designed as an observational retrospective cross-sectional study. Data collection lasted from March 2014 to June 2014. The study included all children tourists hospitalized at Clinical Department of Pediatrics, Split University Hospital Center during their vacation from January 2007 till December 2013. The term 'foreign patients' included all children aged under18 years that did not have residence in Croatia or Croatian health insurance. For each patient, we inspected medical history and letter of discharge.

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The data collected included chronological age, gender, nationality, month and year of hospitalization, length of hospital stay, and type of diagnosis. According to chronological age, patients were categorized in three groups considering completed years of life: 0-5 years, 6-11 years and 12-17 years. To analyze morbidity, patients were divided into 12 groups according to the organ system affected (blood and blood-forming, endocrine, nervous, circulatory, respiratory, digestive, skin, musculoskeletal and connective tissue, genitourinary disease, external causes of disease (submersion and heat injuries), injury and poisoning, and ear infection. We also made subgroups according to specific diagnosis for the most commonly affected organ systems. Nervous system diseases included epilepsy and epileptic attack, febrile convulsions, syncope, inflammatory brain disease, tumor of the central nervous system, headache, delayed motor development, and nerve palsy. Injury and poisoning included light and grave bodily injury, and intoxication with the alcohol, cannabinoids, medicine, carbon dioxide and insecticide. Respiratory diseases included upper and lower respiratory system infection and foreign body aspiration. Submersion, decompression illness, burn and sunstroke were included in the group of submersion and heat injuries. Digestive diseases included gastroenterocolitis, vomiting, appendicitis, ileus, gastrointestinal bleeding, gastrointestinal neoplasm, gastrointestinal foreign body, and recurrent abdominal pain. All data were processed using Microsoft Office Excel 2010. Descriptive statistical analysis was done by the Statistica version 8.0.360 software.

RESULTS

We found 233 children tourists hospitalized at Clinical Department of Pediatrics, Split University Hospital Center, in the period from January 2007 to December 2013. For four patients data were missing (date of birth, chronological age), so they were excluded from the study. Another two patients with missing data on their nationality were also excluded from the study. There were 134 (57.5%) boys and 119 (51.1%) children tourists were aged 0-5 years (Table 1). According to nationality, they were from 30 countries from all over the world, but mostly from Europe (97.9%). The highest number of children tourists were from Germany (14.2%), Czech Republic (13.3%), Poland (11.6%) and Slovenia (8.6%) (Figure 1). A total of 216 (92.7%) patients were hospitalized during summer months (Figure 2). The mean length of hospital stay was 4.4±3.3 days. We noticed an increased number of hospitalized children tourists through the six-year period, with 28 hospitalized children in 2007 and 38 in 2013 (Figure 3). The mean age of children tourists was 7.4±5.7 years. According to the reason for hospitalization, we noticed that children tourists were mostly admitted for nervous system symptoms (32.6%); most of these had febrile seizures (43.4%) and epilepsy and epileptic attacks (39.5%). On the second place (14.6%) were injuries and poisoning with the percentage of representation of 61.8% and 38.2% respectively. Respiratory symptoms ranked third according to morbidity (14.2%); most of these patients had lower (42.4%) and upper (36.4%) respiratory infection. On the fourth place (9.9%) followed submersion (65.2%) and heat injuries (34. 8%). On the fifth place were children tourists

TABLE 1. **Demographics of study patients (N=233)**

Characteristic	Number of patients (%)
Gender	
Male	134 (57.5)
Female	99 (42.5)
Age (yrs)	
0-5	119 (51.1)
6-11	49 (21)
12-17	65 (28)

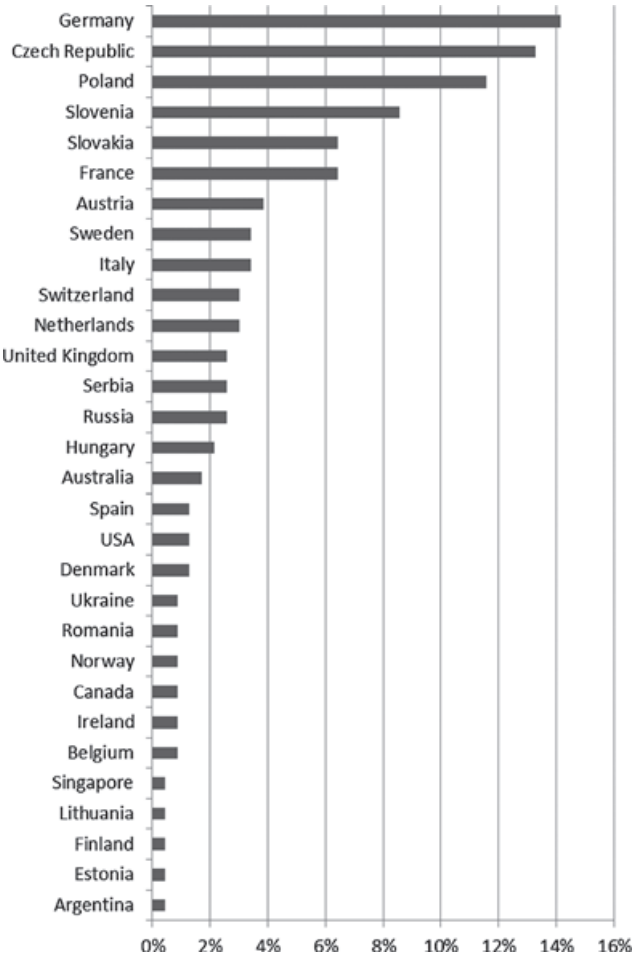

FIGURE 1. **Distribution of 233 foreign children hospitalized at Clinical Department of Pediatrics, Split University Hospital Center, according to nationality.**

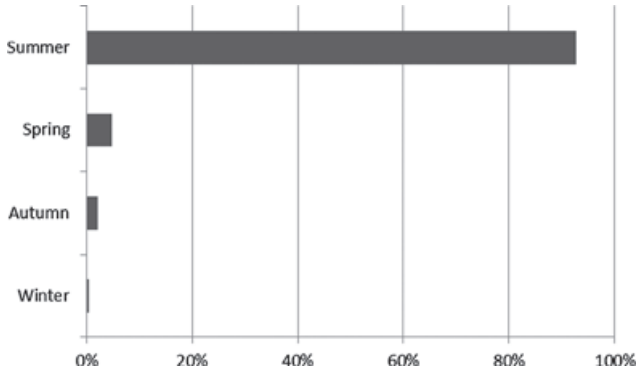

FIGURE 2. Seasonal variation in hospitalization of foreign children at Clinical Department of Pediatrics, Split University Hospital Center (N=233).

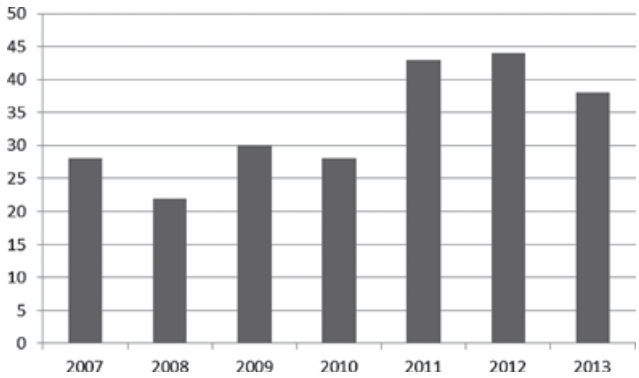

FIGURE 3. Annual distribution of foreign children hospitalized at Clinical Department of Pediatrics, Split University Hospital Center, during the 2007-2013 period (N=233).

TABLE 2. Patient distribution according to the reason for hospitalization (N=233)

Disease	Number of patients (%)	Age (yrs)			Gender	
		0-5	6-11	12-17	Male	Female
Blood and blood-forming	4 (1.7)	1	2	1	2	2
Endocrine	6 (2.6)	1	2	3	6	0
Nervous	76 (32.6)	43	14	19	44	32
Circulatory	6 (2.6)	4	1	1	3	3
Respiratory	33 (14.2)	23	6	4	21	12
Digestive	22 (9.4)	8	7	7	11	11
Skin	7 (3.)	4	1	2	5	2
Musculoskeletal	2 (0.9)	2	0	0	0	2
Genitourinary	18 (7.7)	12	1	5	5	13
Submersion and heat injuries	23 (9.9)	12	6	5	13	10
Injury and poisoning	34 (14.6)	9	9	16	22	12
Ear infection	2 (0.9)	0	0	2	2	0

with digestive symptoms (9.4%); among them, gastroenterocolitis was most common (31.8%). In total, there were 12 groups according to the organ system involved (Table 2).

The most common cause of hospitalization in all age subgroups was neurological. A great number of children tourists aged 12-17 years (24.6%) had some kind of intoxication or were hospitalized due to trauma. The most common cause of intoxication was alcohol or drug abuse (53.8%). Among children tourists aged 6-11 years, a large number were also hospitalized due to injury and poisoning (18.4%), or digestive diseases (14.3%). Also, children tourists aged 0-5 occasionally had respiratory diseases (19.3%), genitourinary symptoms, and submersion and heat injuries (10.1%) (Table 2).

Considering gender, the diseases under study were equally distributed, except for endocrinological diseases (100%) and injury and poisoning (64.7%), which were more common in males, and genitourinary diseases that were more common in females (72.2%). Almost all urinary tract infections were found in girls aged 0-5 years (72.7%), and alcohol abuse in boys aged 12-17 years (62.5%).

DISCUSSION

There are not many studies in the literature on the topic of morbidity in children tourists while on their vacation. Our study showed the morbidity of foreign tourist children while visiting Croatia. The results of this study may be considered as a guide, both for medical and tourist personnel, as well as for tourists. *Behrens and Carroll* in their study pointed to the importance of examination of travel trends and patterns of travel-associated morbidity (5). Examination of the causes of mortality and morbidity leads to changing emphasis on the ways to reduce morbidity. Increasing numbers of those affected by travel-related illnesses have led to continuing monitoring of travelers and prevention of diseases in some countries. Among US travelers, illnesses of the digestive tract were most common (58%), followed by systemic febrile illnesses (18%) and dermatologic diseases (17%) (6). *Neumayr et al*. have provided a practice-oriented overview of relevant health risks. Such overview may be considered when counseling travelers visiting South America (7). While providing pretravel advice, health professionals need to consider tourist age and his/her general health condition, travel destination, specificity, and susceptibility to travel-related morbidities (8-10).

The most common condition that required hospitalization of foreign tourist children during vacation in Croatia was nervous system morbidity. We expected this finding because more than half of the children were under age 6, which is in correlation with the usual distribution of pediatric morbidity according to age and gender. Febrile seizures and epilepsy are diseases that usually occur in younger age, with no gender difference (11-13). On the other hand, a

large number of adolescent population were admitted to our hospital because of injury and poisoning. This observation is similar to the results reported by *Nicolson et al*. (14). Overconsumption of alcohol contributes to unpredicted behavior and loss of sexual control, so the risk of sexually transmitted diseases may be increased (15). Also, alcohol increases the risk of all types of injury (16). We concluded that injury was a common cause of hospitalization in children older than 6 years. *Van As et al*. and *Schrieff et al*. found that many 6-year-old children experienced thoracic or head trauma (17, 18). Physical characteristics (such as lower weight and height than in adults, thinner skin, disproportional head size) and psychological characteristics (lack of experience, immaturity, curiosity) increase the injury risk in children. The accidents that require hospital care or have lethal outcome in many cases are traffic accidents, submersions, falls, and intoxication. In 2008, Croatia ranked twelfth among 38 European countries considering children trauma mortality, and the incidence was constant during the 2001-2012 period (19). Understanding the causes and mechanisms of injury may help in prevention strategies and reduction of mortality (20). Other frequent diseases were respiratory, submersion and digestive system disorders. Respiratory infections are some of the most common human diseases worldwide, with a complex and diverse etiology (21, 22). Submersion is a major public health problem. Children aged less than 5 years and males are particularly at risk (23). This is consistent with our results because 53.3% were in the 0-5 age group and 73.3% were males. Acute diarrhea continues to be an important cause of hospitalization in young children. Gastroenteritis is a common reason for hospital admission in previously healthy children during the first years of life (24).

Croatia is a desirable tourist destination that offers a well-organized and accessible medical care. We suppose that if tourists are pleased with medical care provided in case of need, they will never avoid our country and consider it again as their future vacation destination. The mean length of hospital stay was 4.4±3.3 days, which is consistent with the mean overnight stay in Croatia (1). We suggest that collaboration among medical workers, health educators and those involved in travel business be constantly improved. Data show that such collaboration is steadily increasing in quality (25). There is an excellent example of good cooperation between local government and medical workers during Ultra Europe Festival in Split, Croatia. The population that attends the Festival are mostly young healthy people. However, Festival is associated with alcohol and drug abuse, so the risk of injuries is also increased. It has therefore been recognized by our local authorities. A greater number of medical teams and well organized medical care have to be provided for tourists visiting this Festival. In such way, it may be postulated that morbidity and unwanted consequences of injuries would be reduced. Following this example, our study offers suggestions regarding reduction of pediatric tourist morbidity. We strongly propose cooperation between the Croatian health care system and Croatian National Tourist Board to develop prevention strategies regarding morbidity of pediatric tourist population in Croatia. Prevention of seizures and epileptic attacks, as the most common morbidity in children, should be especially emphasized. Therefore, we suggest that adequate information material for parents be given to all tourists entering Croatia; for example, general information regarding sun protection, tips for behavior in the wild, or how to avoid traffic accidents. Furthermore, first line therapy (intranasal midazolam or rectal diazepam) for treatment of convulsions should be broadly available, in hotels, apartments, and even on beaches (26). We hope that it would improve the picture of Croatia as a country not only with nice beaches and picturesque places, but also a country with well organized medical care system in case of need.

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SAŽETAK

Pregled bolesti u djece turista za vrijeme posjeta Splitsko-dalmatinskoj županiji

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Cilj je odrediti morbiditet u strane djece za vrijeme turističkog posjeta Splitsko-dalmatinskoj županiji, Hrvatska. U istraživanje je uključena medicinska dokumentacija 233-je strane djece turista u dobi do 18 godina, hospitalizirane na Klinici za dječje bolesti KBC Split u razdoblju od siječnja 2007. do prosinca 2013. godine. Demografski podatci su statistički analizirani. Od ukupno 233-je djece turista hospitalizirane na našem odjelu njih 134 (57,5%) bili su dječaci. Većina djece turista (51,1%) bila je u dobnoj skupini od 0-5 godina. Prema nacionalnosti bila su iz ukupno 30 zemalja diljem svijeta, ali većinom iz Europe (97,9%). Najveći broj djece turista bio je iz Njemačke (14,2%). Najviši postotak djece turista (92,7%) bio je hospitaliziran ljeti. Hospitalizacija je prosječno trajala 4,4±3,3 dana. Najčešći razlozi hospitalizacije djece turista bili su neurološki simptomi (32,6%), od toga je 43,4% imalo febrilne konvulzije i 39,5% epilepsiju. Zatim su slijedile ozljede i trovanja (14,6%), od toga su ozljede bile prisutne u 61,8% slučajeva, a trovanja u 38,2%. Blesti dišnog sustava (14,2%) treće su po učestalosti, većina bolesnika imala je upalu donjih (42,4%) ili gornjih (36,4%) dišnih puteva. Potom slijede utapanja i ozljede toplinom (9,9%) te bolesti probavnog sustava (9,4%). Zaključno, opisali smo stranu pedijatrijsku populaciju hospitaliziranu u KBC-u Split za vrijeme turističkog posjeta Splitsko-dalmatinskoj županiji. Najveći broj djece turista bio je iz Njemačke i najčešći razlog hospitalizacije bili su neurološki simptomi. Stoga predlažemo suradnju između Ministarstva zdravlja i Hrvatske turističke zajednice radi razvoja strategije za prevenciju bolesti, uzimajući u obzir morbiditet u djece turista. Posebice treba naglasiti prevenciju cerebralnih napadaja te činjenicu da bi prvolinijska terapija trebala biti široko dostupna, primjerice u hotelima i apartmanima, pa i na plažama.

Ključne riječi: morbiditet; pedijatrija