Necrotizing fasciitis in children in eastern Ontario: a case–control study

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Research

Recherche

1. Obiectivele?
2. Tipul de studiu?
3. Abordare-retrospectiva/prospectiva?

De ce?

tween necrotizing fasciitis and cellulitis is essential for early and effective management.

The objectives of our study were to document potential increases in the frequency of necrotizing fasciitis at a tertiary care pediatric hospital in Ontario, and to attempt to determine the unique clinical and laboratory features that distinguish necrotizing fasciitis from that of cellulitis.

We conducted a retrospective case–control study of all children with necrotizing fasciitis presenting to the Children's Hospital of Eastern Ontario (CHEO), in Ottawa. CHEO is a tertiary care hospital and the only pediatric inpatient facility in the city. Serving eastern Ontario and western Quebec, it has a catchment area of 1.5 million people and receives about 49 000 patient visits per year through the emergency department. The study design was approved by the CHEO Research Ethics Committee.

The charts of all children with necrotizing fasciitis under 18 years of age admitted to CHEO between June 1, 1983, and May 31, 1999, were reviewed. Necrotizing fasciitis was defined as a

4. Populatia studiata?

- Cazurile/martorii
- Lotul martor bine ales functie de obiective?

5. Cum au fost definite grupurile?

Cases were identified by searching the hospital's discharge diagnosis database using the International Classification of Diseases, 9th revision (ICD-9) code corresponding to the diagnosis of necrotizing fasciitis. To ensure that no cases were missed, all charts identified with the ICD-9 codes for myositis, gangrene, gas gangrene and erysipelas were also reviewed. Charts of children with group A β-hemolytic *Streptococcus* cultured from sterile sites during the same study period were also reviewed.

Control subjects were children under 18 years of age admitted and treated at CHEO for cellulitis. They were identified by ICD-9 codes based on the discharge diagnosis recorded by the attending physician. Control subjects were randomly selected and matched to the case subjects first by date of admission and then by closest date of birth (first by day, then by month and, if necessary, by year). Three control subjects were identified for every case subject.

6. Care au fost variabilele masurate?

data. Age, sex, demographic information, diagnosis, site of infection, presenting signs and symptoms, comorbidities, blood values, culture results, treatment and outcome were recorded. Presenting signs and symptoms included focal swelling, focal erythema, focal pain, focal splinting, significant tenderness, generalized erythematous rash and "toxic appearance," as described by the emergency physician. If no record was made of these features they were assumed to be absent. Focal splinting was defined as refusal to use the affected part of the body. Significant tenderness was defined as substantial pain, as recorded on examination by the physician. Blood values obtained at presentation included the following: hemoglobin, white blood cell count and differential, platelet count, erythrocyte sedimentation rate, alanine aminotransferase (ALT) level and creatinine kinase level. Outcome fell into 1 of 4 categories: complete recovery, temporary disability requiring rehabilitation or further follow-up, permanent disability, or death.

De ce credeti ca a fost necesar ca datele sa fie extrase de aceeasi persoana?

De ce credeti ca a fost necesar ca evaluarea datelor sa fie facuta in orb si independent?

Variable	Case subjects *n = 8*	Control subjects *n = 24*	*p* value
Mean age (and range), yr	5.00 (2.10–13.08)	4.62 (0.44–14.6)	0.69
Male sex, no. of children	3	16	0.22
Signs and symptoms, no. of children			
Generalized erythematous rash	4	2	0.02
Toxic appearance	4	1	< 0.001
Focal swelling	7	17	0.64
Focal erythema	7	24	0.25
Focal pain	7	7	0.10
Focal splinting	3	3	0.15
Significant tenderness	3	3	0.15
Vital signs			
Mean heart rate (and range), beats/min	136.25 (80–156)	121.42 (80–186)	0.10
Mean respiratory rate (and range), breaths/min	31.50 (20–48)	25.42 (18–38)	0.02
Mean systolic blood pressure (and range), mm Hg	104.88 (90–120)	*n = 19* 106.47 (86–130)	0.79
Mean diastolic blood pressure (and range), mm Hg	55.63 (40–80)	*n = 19* 64.53 (47–93)	0.07
Mean temperature (and range), °C	38.7 (38.0–39.4)	37.8 (36.1–40.7)	0.006
No. with history of fever	8	10	0.004

Cum definim tabelul contingenta?

		GRUPURI STUDIU		
		CAZURI (Fasceita-DA)	MARTORI (Fasceita-NU)-celulita	
FACTOR RISC	DA (EXPUSI)	a	b	a+b
	NU (NEEXPUSI)	c	d	c+d
		a+c	b+d	

Cota la cazuri=a/c

Cota la martori=b/d

OR=[a/c]/[b/d] =ad/bc

Spre deosebire de cohorta, se calculeaza cotele (odds) factorului de risc la cazuri respectiv martori!!!!!

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OR pentru rash eritematos generalizat?
OR Aspect toxic?
OR Edem local?
OR Eritem local?
OR Imobilizare locala?
OR Sensibilitate semnificativa?

(control subjects) in eastern Ontario

Variable	Case subjects *n = 8*	Control subjects *n = 24*	*p* value
Blood values			
Mean white blood cell count (WBC) (and range), x 10^9/L	17.12 (3.14–40.5)	13.22 (5.64–23.5)	0.53
No. with high WBC*	5	6	0.09
No. with low WBC†	2	0	0.06
Mean hemoglobin level (and range), g/L	117.63 (95–141)	121.33 (101–143)	0.47
Mean platelet count (and range), x 10^9/L	194.00 (15–375)	299.33 (157–458)	0.03
No. with low platelet count‡	2	0	0.06
Comorbidity			
Varicella infection	4	7	0.40
Surgery	1	1	0.44
Trauma	2	12	0.41
Culture result, no. of children			
Group A β-hemolytic *Streptococcus*	7	4	< 0.001
Staphylococcus aureus	1	5	1
	n = 7	*n = 23*	
Positive blood culture	3	1	0.04
Outcome			
No. admitted to ICU	7	0	
Mean length of stay in ICU (and range), d	4.38 (0–11)	0 (0–0)	< 0.001
Mean total length of stay (and range), d	23.38 (17–38)	3.92 (1–14)	< 0.001
No. with temporary disability	7	2	< 0.001

Note: ICU = intensive care unit.
*High WBC = > 15.5 x 10^9/L.
†Low WBC = < 5.5 x 10^9/L.

7. Care sunt concluziile studiului?
8. Care au fost limitarile studiului?
9. De ce s-a optat pentru un design de studiu caz-martor?
10. Cum ati continua studiul? Ce alt studiu ati initia plecand de la concluziile prezentului studiu?

a secondary skin infection and a toxic appearance.

Given the retrospective nature of our study, it was limited because of missing data in some of the charts and a lack of standardization in the parameters reviewed. Because of the small number of cases of necrotizing fasciitis identified, potentially significant features may not have been identified.

In summary, we found that the number of cases of necrotizing fasciitis has increased over the past 16 years in the Ottawa region. Factors that help distinguish necrotizing fasciitis from cellulitis include a generalized erythematous rash, toxic appearance, fever and low platelet count. Further research of this disease and its presenting signs and symptoms, perhaps in the form of a large multicentre study, are needed to help clinicians with the early identification and treatment of these cases.