Bulletin of the *Transilvania* University of Braşov
Series VI: Medical Sciences • Vol. 5 (54) No. 1 - 2012

EPIDEMIOLOGICAL, CLINICAL AND LABORATORY ASPECTS OF INFECTIOUS CELLULITIS

C. COSTACHE[1] D. COSTACHE[2] A.T. BOGDAN[3]

Abstract: *This retrospective study was conducted during the years 2010-2011 on a total of 81 patients with infectious cellulitis who were hospitalized, diagnosed and treated in the Brasov Infectious Diseases Hospital at this time. Characteristics of patients lot that were studied are: the distribution of cases by sex and age groups, different types of onset, associated pathologic plot, incriminated pathogen agent, seasonal incidence, days number of hospitalization.*

Key words: *cellulitis, lesion, pathogenesis.*

1. Introduction

Infectious cellulitis is an acute infection of subcutaneous tissue, most commonly caused by bacteries through a solution of discontinuity of the skin.

Human skin structure contains a hair follicle (hair root).

External skin (cutis) has 3 main layers:

- skin (epidermis)
- dermis (dermis or Corium)
- hypodermis (Subcutis)

Normal flora of skin contains: coagulase-positive staphylococcus, Staphylococcus aureus, Streptococcus pyogenes, multiple species of Corynebacterium, Propionibacterium, Candida.[3]

2. Objectives

They pursued the following objectives:

1. Cellulite incidence by age and sex.
2. Features analisis of cellulite debut.
3. Means importance applied in the diagnosis.
4. 4.Establishing of correlations between the clinical onset and biological parameters modification.
5. Establishing an correct diagnosis based on clinical and laboratory manifestations.
6. Pathogen agents commonly involved in cellulitis.

[1] *Transilvania* University of Braşov. Departament of Anatomy.
[2] *Transilvania* University of Braşov, Departament of Infectious Disease, postdoctoral researcher at School for Livestock Biodiversity and Food Biotechnology, Bucharest, Romania within Romanian Academy.
[3] Romanian Academy, National Institute for Economical Research (INCE)-Center for Agroforestry Biodiversity Study and Research (CSCBA)- Postdoctoral School for Livesstock Biodiversity and Food Biotechnology, Bucharest, Romania.

3. Materials and Method

This retrospective study was conducted during 2010-2011 on a total of 81 patients with infectious cellulitis who were hospitalized, diagnosed and treated in the Brasov Infectious Diseases Hospital, in this period.

Patients lot characteristics that were studied: the distribution of cases by sex and age groups, different types of onset, associated pathologic plot, incriminated pathogen agent, seasonal incidence, days of hospitalization.

To study these patients we served of anamnestic data, clinical and biological parameters. Those were collected from existing documentation, discharge tickets and clinical observation sheets.

The diagnosis of cellulitis was determined by evaluating historical, clinical and laboratory data.

Data were summarized for each patient profiling type in the form attached.

Personal sheet type

Patient initials, age, sex

AHC, APF-AM, UM, amenorrhea, spontaneous abortion, APP, drug allergies

Symptoms

History-way of debut,evolution of symptoms,applied medication,echo on the ability to work.

Clinical examination

Laboratory examinations - the usual: CBC + peripheral smear, cholesterol, triglycerides, glucose,

Liver function tests

Acute-phase reactants: ESR, CRP, fibrinogen proteinograma

Optional-cross soft tissue

Diagnosis:

Treatment

Rehospitalization:

Symptoms, clinical

Biological tests evolutivity

For statistical significance we using Chi square test using the contingency table and Yates correction was applied GraphPad program.

4. Results and Discussion

Batch analysis of patients taking in the study. Were taken into account only patients who were diagnosed with infectious cellulitis. We have followed the evolution and observation sheets that helped to extract data from the initial diagnosis.

4.1. Distribution of cases by sex and age groups

For easier tracking sick patients were divided according to sex and debut.

This study was performed on 81 patients including 37 women representing 45.68% and 44 men, representing 54.32% indicating a very slightly increased incidence for males in the study group, according to data literature that shows equal sex incidence of disease in adulthood.

To see the most common age for developing cellulite patients were divided into six age groups like this: a group below 20 years, another group of 20 to 30 years, another 30 to 40 years, another 40 to 60 years, another for 60-80 years and the last is over 80 years. From the 81 patients studied 17.28% patients were younger than 30 years, 13.58% are aged between 30 and 40 years, most ranging between 40 and 60 years, they were of 33.33%, with a statistically significant $p = 0.7713$, and a total of 32.09% between 60 and 80 years, 3.70% is located above the age of 80 years.

Gender distribution by age is not different from data obtained in the literature showing a similar incidence of disease. Those patients with age under 20 were entirely male a rate of 6.17%, the age group 20 -30 years are majority women stood at a rate of 6.17% from 4.93% men.

At age group 30-40de years, they represented the majority group men 8.64% from 4.93% women ,in the 40 to 60 years 18.51% were men and 14.82% women, between 60 and 80 years 13.57% were men and most, with 18.52% were women located and more than 80 years 2.46% were men and 1.24% women.

According to a study conducted in England in 2002-2003 by "Hospital episode statistics, Department of Health", 40% of patients were classified in the age group 25-59 years, 30% in age group 60-75 years 30% were over 75 years. Maximum incidence of this study is the age of 58 years, 11%. Similar data are found in our study. Between 15 and 59 years in Brasov, were most patients with 64.17%, higher percentage than in England, those between 60 and 75 years constituted 28.2% of all patients, similar to the England study showing an incidence of 30% in this age group and over 75 years represented 7.63% of them, a percentage much lower than the study of English, where the percentage is 30%. A special group was constituted by patients with age of 58 years accounted for most patients in the present study (9.75 %) and the English (11%). [2]

4.2. Debut features analysis

If the onset manifestations, 87.3% had typically fever, chills, restlessness accompanied by the appearance of inflammation plaque with edema, erythema and functional impotency. 12.7% of patients had no fever with chills, just local signs.

Local signs were pain or vascular fragility, placard flu emerged, edema, erythema, warmth.

To create a more accurate picture of these skin changes we studied a patient with infectious cellulitis after bite insecta.

We observed marked edema and erythema of the region as a maleollus placard limited flu.

4.3. Events laboratory

For the proper diagnosis is needed and is useful laboratory. Haemograma exams, showing changes that occur in blood cells.

Acute phase reactants are brought up like this: sed rate increased 78.2%, 43.6% in CRP and fibrinogen in percentage of 94.7% of cases.

Fibrinogen determinated in 94.7% percentage varies as follows: in 30.5% of cases its value was included in the normal range, between 200 and 400 mg per 100 ml of blood, 32.42% to values between 400 and 800 mg per 100 ml of blood, 43.22% between 800 and 1000 mg per 100 ml of blood and a rate of 19.06% showed a marked inflammatory syndrome with fibrinogen at levels of 1000 mg per 100 ml of blood.

Along with inflammatory syndrome, 98% of patients had paraclinical examination of neutrophilic leukocytosis.

A percentage of 16.82% patients had only signs of bacterial infection without changes in inflammatory markers.

4.4. Pathogen agent frequently involved

Cultures for detection of the most common pathogen involved cell were obtained from blood cultures and the pathological secretion from the lesions. [5]

Exuding from the lesion has enabled detection of the pathogen in 23% of cases.

Cultures were positive in 69% of the cases studied, 100% in males, with the pathogen Staphilococcus aureus. In a rate of 5% was present Staphylococcus White, 100% in males and 26% of cultures was positive for MRSA .From total of patients with MRSA 21% were male and 5% female.

4.5. Traumatic agent analysis

From the group of patients who developed cellulitis, most were those with wounds caused by dog bites, 8.63%, reported more frequently at males in a rate of 4.93% and 3.70% at females.

Insect puncture wound injuries caused cellulite in a similar percentage of 8.62% dog products but was predominant in females registered a rate of 6.16% and only 2.46% being male.

Cats injuries caused at 6.16% of patients, majority being female 4.93% and 1.23% produced in males.

Seasonal high incidence of cellulitis caused by dog bites, insect bites or injuries caused by cat was observed in July when 14 cases were registered and the minimum in May when only 2 cases were diagnosed.

Of the 21 cases reported in summer, seasonal high incidence of cellulitis was observed in July when 14 cases were registered and the minimum in June with 3 cases reported. In spring maximum incidence was observed in April with 6 cases and the minimum in May by only 2 cases. Winter 22 cases were recorded with a high incidence in December when 10 cases were hospitalized, and the minimum in February with 4 cases. From total of 13 cases recorded in autumn, maximum was observed in November with 5 cases and the minimum case was reported in September with 2 cases.

4.6. Associated pathological plot

The most common diseases associated with cellulite were:

- venous insufficiency in a rate of 16.32%
- liver disease in a proportion of 14.29%
- kidney disease in a proportion of 14.29%
- varicose veins in a rate of 13.26%
- tinea pedis in a rate of 11.22%
- a diabetes rate of 8.13%
- chronic lymphedema in a rate of 3.70%. [4]

4.7. Days of hospitalization

Average days of hospitalization for cellulitis in Brasov is 9.3 days.

Patients enrolled in the 55-64 years age group required hospitalization days maximum, minimum average of 14 days of hospitalization days. Minimum of hospitalization days required patients in the age group 25-34 years with an average of 6 days.

Those under 15 years have required an average of 3 days of hospitalization, those between 15 and 19 years 7 days, between 20 and 24 years 8 days, 25 and 34 years 6 days, 35 and 44 years 8 days, 45 and 54 years 13 days, 55 and 64 years 14 days, 65 and 74 years 10 days, 75 and 84 years 13 days over 85 years and required an average of 11 days of hospitalization.

According to a study conducted in England in 2002-2003 by "Hospital episode statistics, Department of Health", days average of hospitalization for cellulitis in England is similar to that in Romania of 9.3 days.

In Australia the days average of hospitalization for cellulitis is 5.9 days. [2]

4.8. Evaluation of treatments given to patients with cellulitis

Treatment is primarily aimed at suppressing the inflammatory process and infection. Preparations of the antibiotics used was Axetine at 42 patients, representing 51.85% of all patients, used alone or in combination with the antibiotics Oxacillin in 12 patients representing 14.81%, and Penicillin G in 8 patients, representing 9.87% of all patients.

Antibiotics were administered in combination with NSAIDs.

5. Conclusions

In a study group of 82 patients hospitalized at the Infectious Diseases Hospital Brasov, during a calendar year, there were cases diagnosed pathology 37 of cellulite at womens (45.68%) and 44 cases at mens, representing 54 , 32%, which indicates a slightly higher incidence for males, consistent with literature data showing an equal sex incidence of disease in adulthood;

Signs of onset in patients studied are: fever, chills, and local signs present in 87.30% of patients.A rate of 12.70% of patients had only local signs accompanied by disability.

The laboratory manifestations observed bacterial inflammatory syndrome with lymphocytosis and neutrophilia present in 98% of cases.

Acute phase reactants are brought up like this: sed rate increased 78.2%%, 43.6,6% and fibrinogen PCR in 94.7%.

Appearance of cellulite was more common in the age group between 40 and 60 years, with a maximum incidence at age of 58 years;

Cultures were positive in 69% of the cases studied, 100% in males, with the pathogen Staphilococcus aureus, Staphylococcus white was present in 5% of cases and MRSA in 21%.

From the group of patients who developed cellulitis, most were those with wounds caused by dog bites 8.63%, reported more frequently in males

Insect puncture wound injury occurred in 7.39% cases cellulite and cellulite produced after cat bite in 6%. In both cases involving the majority was female.

Seasonal high incidence of cellulitis was observed in summer, in July (14 cases), and the minimum in May (2 cases).

The most common diseases associated with cellulite were:

- Venous insufficiency, 16.32%,
- Liver in a rate of 14.29%
- Kidney disease in a proportion of 14.29%
- Varicose veins-13.26%,
- Tinea pedis, 11.22%,
- Diabetes8.13%,
- Chronic lymphedema to 3.70% of patients;

Paraclinical 98% of patients had leukocytosis with neutrophilia and inflammatory syndrome;

Average days of hospitalization is in Romania, as in England of 9.3 days and 5.9 days in Australia. [5]

Treatment of these events consists of antibiotics preparations, use of the Axetine was used in 42 patients, 12 patients Oxacillin and Penicillin G 8 patients. Antibiotics was used as monotherapy or as combination therapy with other antibiotics.

Antibiotic treatment was associated with anti-inflammatory treatment in 100% of the cases.

Acknowledgments

This work was cofinanced from the European Social Fund through Sectorial Operational Programme Human Resources Development 2007-2013, project number POSDRU/89/1.5/S/63258 ”Postdoctoral school for zootechnical biodiversity and food biotehnology based on the eco-economy and the bio-economy required by eco-sano-genesys”

References

1. Durand, M.L.: *Periocular infections*. In: *Principles and Practice of Infectious Diseases, 7th edition*, Mandell, GL, Bennett, et all. (Eds), Churchill Livingstone Elsevier, Philadelphia 2010. p.1569-1572.

2. Howe L., Jones N.S.: *Guidelines for the management of cellulitis/abscess.* Clinical Otolaryngology Allied Science 2004; p:29:725.
3. Rebedea, I.: *Infectious Diseases*. Bucharest. Medical Publishing House, Romania, 2000. p:255-257.
4. Ryan, J.T., Preciado, D.A., Bauman N., et al.: *Management of cellulitis in patients with radiographic findings of subperiosteal abscess.* In: Otolaryngology Head Neck Surgery 2009; p:140:907.
5. Todman, M.S., Enzer Y.R.: *Medical management versus surgical intervention of pediatric cellulitis.* In: Ophthalmological Plastic Reconstruction Surgery 2011; p:27:255.