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EMERGENCIES IN INFECTOLOGY AND DEPENDENCY ON THE OUTPATIENT HEALTHCARE

Gospodinova M., S. Mileva, Ì . Nenova

Department of Infectious diseases, Epidemiology and Tropical Medicine, Medical University of Varna

Reviewed by: assoc. prof. V. Madjova

ABSTRACT

Emergencies are the primary cause of lethality in infectious diseases. OBJECTIVES: Our aim was to study some emergency situations in infectology in relation to the outpatient healthcare. METHODS: We used data from the official acute infectious diseases registration, the outpatient journals, the admission journals and the hospital documentation of the Department of Infectious diseases of "Saint Marina" Hospital in Varna for the period 2006-2007. RESULTS: We examined 6604 patients, 2378 of which were admitted in the hospital. Emergency cases were 538 (22,62%). In that period were treated 373 infants with diarrhea, 55 patients with nervous system infections, 108 with Mediterranean spotted fever(MSF) and 2 with Congo-Crimmean haemorrhagic fever. Only 21,71% of the infants with diarrhea considered to be at risk had the necessary minimum of labs on admission. Similarly, 13,89% of the patients with MSF had some labs. For 24% of the patients in this study the specialist of infectious diseases on admission was the first physician who performed a clinical examination. We found a delay in the hospital admission in 15,61% of the cases. CONCLUSIONS: The data processed showed many problems in the relationship between the outpatient and the inpatient management. The major ones are: delayed diagnosis or unrecognized infectious disease (mostly the tick-borne spotted fevers), a poor assessment of the diarrhea severity in infants, difficulties to provide consultants and laboratory analysis for fast and accurate diagnosis and inappropriate antibacterial treatment before the diagnostic activities, impeding the etiologic identification.

Key words: infectious diseases, emergency, outpatient healthcare, lethality

INTRODUCTION

The period of transition and joining of Bulgaria to the European Union required maintenance of the healthcare quality in a situation of chronic financial deficit.

This new situation affects all sections and specialties in healthcare and have a major significance for the infectious diseases, considering their medical and social aspect. The changes in the traditional system for epidemiologic surveillance and control in combination with the financial withdrawal of a number of public institutions from diagnostic and treatment of the contagious and non contagious infectious diseases had negative impact on morbidity, mortality and lethality related to them. The structure of the infectious pathology has also changed - some diseases are rarely seen, while others, newly emerged occupy the free niches.

On a background of increased morbidity due to infectious diseases in 2004 -7509, 405%îî, compared to the period 2001 - 2003 (2), mortality stays almost constant - 1,988%îî as well as lethality - 0,026%.

Address for correspondence:
M.Gospodinova, Dept. of Infectious diseases,
Medical University of Varna
55 Marin Drinov str, Varna 9000
e-mail: dr_m_gospodinova@abv.bg

Emergency situations are the main cause of lethality from infectious diseases. Daily practice shows often delay in the diagnosis and treatment.

Emergencies in infectology are:

1. Shock due to an infectious disease. Toxiinfectious shock ± multiorgan failure (MODS), haemorrhagic, hypovolemic, etc.
2. Waterhouse - Friderichsen syndrome (SWF).
3. Neuroinfections with cerebral edema or flaccid paralysis.
4. Acute diarrheal infections, complicated with dehydration and toxicosis in infants.
5. Acute failure of the liver, kidneys, hearth and respiratory system.
6. Infectious diseases, subjects of international special surveillance and control measures.
7. Emergencies due to other infectious diseases, subjects of strong epidemiologic control.

OBJECTIVES

Considering the facts discussed above, we decided to investigate some conditions of emergency in infectology in their relation to the outpatient care. According to this purpose we focused on the following diseases:

1. Acute gastroenteritis in infants under 1 year of age.
2. Transmissive diseases in elderly.
3. Neuroinfections and SWF.

METHODS

Data of the official registration of the acute contagious diseases were used, as well as the ambulatory and the admission journals of the Department of Infectious diseases, "Saint Marina" Hospital of Varna for the period 2006 - 2007, plus the hospital documentation of 538 patients. For estimation of the results epidemiological, statistical, clinical and laboratory methods were used. We presented the total number of patients referred to the Department of Infectious diseases (DID) in tabl.1.

Òabl.1. Patients, referred to the Infectious department for the period 2006-2007 from different healthcare facilities

Year	Outpatients, examined in the Department of Infectious diseases	Hospitalized	Referred from: OCIDS, GP, EC, Came unreferred	Control examinations, consults, referred from another hospitals
2006	5128	1824	4416	712
2007	1476	554	1335	141
Total	6604	2378	5751	853

Legend: OCIDS-outpatient care infectious diseases specialists; GP-general practitioner; EC-emergency centre

RESULTS AND DISCUSSION

Acute gastroenteritis in infants under one year of age

Gastroenterites are a major problem in infancy all over the world and in the developing countries millions of deaths are due to them every year (6,4). Acute diarrheal diseases in our country are a main part of the infectious pathology due to climatic peculiarities, feeding practices and life standard. They depend on the infectious etiology, social status of the population and the healthcare organization (8).

A total of 373 children under 1 year with diarrheal syndrome were treated in the Infectious department during the investigation period. Of them, 74,30% were considered at risk, according to the following indicators:

1. Hypotrophy
2. Inappropriate feeding practices
3. Prematurely born
4. History of frequent infections of the gastrointestinal and respiratory system
5. Severity of the gastroenteritis, estimated using the criteria below:
   - Dehydration level > 6% /^{22} - ^{222} level/ and related symptoms
   - Pronounced intoxication with Ò 36^o < t > 39^oC
   - Electrolyte derangements - K < 3 mmol/l or > 6 mmol/l, Na < 120 or >150 mmol/l
   - Shock ± acute renal failure(ARF),
   - Central nervous system symptoms /cerebral edema/
   - Paralytic ileus
   - Generalized or nonintestinal localization of the disease process
6. Epidemiologic history

Analysis of the data about the motion of the patients with diarrheal syndrome on table 2 shows:

1. Only 31,63% of the infants with acute diarrhea were referred to the hospital for admission from general practitioners. Almost 1/4 came unreferred, 36,19% came from pediatric emergency outpatient care unit (PEOCU) or were transported by an emergency equipe directly from home. Those 58,97% are hospitalized mostly through the weekends and the nights.
2. Any laboratory investigations before admission had only 21,71% of the infants hospitalized, most of them were performed in PEOCU and in the emergency unit. Analysis included haemoglobin level, white blood count, acid-base profile.
3. 13,40% were treated at home for over 7 days, with 1 antibiotic agent 20,64%, with 2 agents - 2,94%.
4. The level of dehydration was not estimated in due time. All children had 2-nd and 3-th level of dehydration and different degrees of electrolyte and acid-base disturbances. 11,20% of them had toxicosis.
5. A hospital stay was 7 to 9 days.

Investigating the medical documentation of 300 patients, treated in the hospital for gastroenteritis, we found that 508 diarrheal patients were hospitalized from May to July 2006. They are 75,70% of the total number of diarrheal patients, reported by the regional survey for epidemiologic control for the period. In the same time over 2000 cases of acute viral diseases and acute respiratory diseases were reported, which do not require etiologic diagnostic efforts, according to the current national decrees for prevention and control of the contagious diseases. Therefore, not all cases of diarrheal diseases had been reported. The contact persons had not been investigated either, for the lack of information for them.

To reduce the risks, WHO and UNICEF published recommendations for the key steps in the management of acute diarrhea in infants, based on multicentral observations in different world regions (7,5).

Key steps, recommended from WHO and UNICEF for managing of acute gastroenteritis infants and young children:

À. Hospitalization in due time of all infants with bloody diarrhea and of risk groups.

Tabl. 2 Infants under 1 year with diarrheal syndrome, admitted to the Department of Infectious diseases for the period 2006-2007

Indicators	**Referred from GP**		**Referred from OCIDS and other specialists**		**Referred from emergency units**		**Came unreferred**	
	31,63%		9,38%		36,19%		22,78%	
	2006	**2007**	**2006**	**2007**	**2006**	**2007**	**2006**	**2007**
	92	26	29	6	117	18	61	24
Duration of illness before the admission: 1 day	37	7	7	3	54	9	27	7
2 days	11	5	4	0	24	3	4	4
3 days	14	3	7	0	0	2	9	3
4 days	8	3	7	0	0	2	5	2
5 days	1	1	1	1	0	0	7	3
6 days	4	0	0	1	0	0	0	0
Over 7 days	17/18,47%/	3	3	1	10	2	9	5
With laboratory analysis 21,71%	1	4	0	2	67	11	3	0
Treated with: 1 ÀB	23	5	4	1	21	1	12	10
2 ÀB	4	3	0	0	1	0	3	0
> 2 ÀB	0	0	0	0	0	0	1	0
Hospital stay-days	9 ±2,5	7,6 ±1,3	7 ±2,05	8 ±3,6	8,4 ±3,2	6,7 ±2,3	8,7 ±2,6	7,8 ±3,5

Legend : ÀB – antibiotic agent

B. Prevention/treatment of the dehydration with oral rehydration solutions.
C. Continue breast feeding or with adapted formulas.
D. Reassessment of the children at risk every 2 days.
E. Encourage the mother to seek medical attention from the doctor earlier in case of worsening in the child condition.

Transmissive diseases

The last few years are extremely favorable for the emergence of transmissive diseases in our country and Varna region is one of the leaders in the morbidity of Mediterranean spotted fever (MSF) (1). In 2001 Congo-Crimmean Haemorrhagic (CCHF) reappeared.

Since 1994 for a period of 10 years in Varna region are registered 1634 patients with MSF, and for the period 2006 -2007 - 194 (3). From these 194 patients, 108 were hospitalized, only 13,89 % of them had laboratory analyses before admission. Ì SF usually has severe course or of intermediate severity with vasculitis, haemorrhagic syndrome and multiorgan failure. Sixteen patients (1,61%) from the total of 993 patients treated in the hospital from 1994 to date have died. The median age of the patients with a fatal outcome is 66,00 ±11, 47 years /from 46 to 82 years of age/. Lethality is closely related to the patients'age and accompanying diseases, but mostly to the duration of illness before the hospitalization - an average of 10,50 ±0,58 days. In that period they were treated as having acute viral disease. Epidemiologic history was not taken and the rickettsial etiology was not suspected. The average duration of the hospital stay in fatality cases was 27,50 ±15,20 hours.

The situation for the patients with CCHF is very similar - there was one case in 2004 and another one in 2005.

General data about the patients with delay in the admission are shown in tabl. 3.

Òabl.3 Patients with a delay in the admission to the Department of Infectious diseases

Infants with diarrheal syndrome	**Patients with infections of the nervous system**	**Patients with MSF**	**Patients with CCHF**	**Total**
39 10,45%	16 29%	27 25%	2 100%	84 15,61%

Infections of the nervous system

Thirty one patients with nonpurulent meningitis were investigated, 19 with purulent meningitis and meningoencephalitis (staphylococcal, pneumococcal and undiagnosed), 3 patient with encephalitis and 2 with meningococcal infection and SWF. Patients with acute flaccid paralysis were excluded, because few of them were referred to DID, irrespective of the Definition of WHO for etiologic identification of the cases with flaccid paralysis and the current decrees for epidemiologic control of these poliomyelitis-like diseases.

Tabl.4. Patients with neuroinfections, referred to DID

Referred from:	**GP**	**OCIDS and other specialists**	**Emergency care units**
	27 /49,00%/	12	16
Duration of illness before the admission:			
1 day	16	4	4
2 days	5	1	1
3 days	4	-	3
5 days	1	2	4
6 days	1	-	1
Over 7 days	-	2	1
Treated before admission - 45,45%	7	8	10
With labs - 80%	27	1	16
Average duration of hospital stay	15,00±3,50	19, 00 ±5,60	16,50 ±2,36

Analysis of the data presented in table 4 shows that neuroinfections were recognized in due time, the reaction in the outpatient healthcare facilities was fast and patients were admitted for hospital treatment in the first 3 days of illness. 49,00% of them were diagnosed by a GP, the rest of them from other physicians. 80% had laboratory analysis before admission: haemoglobin, white blood count, differential count, etc. Some had chest x-rays. In a few cases examination of papillas and of cerebrospinal fluid was made. 45,45% of the patients were treated with antibiotics before hospitalization. The routine clinical practice shows even hyperdiagnosis of the meningitis, to DID were referred patients with intracranial haemorrhages, tumors, abscesses, etc.

Two of the patients with fatal outcome had meningococcal disease - a 4 years old child and 19 years old man with SWF - one of the severest emergencies in medicine. The outcome is strongly dependent on the physician's actions in the first hours of the illness.The child was referred to the hospital on the second day of the appearance of symptoms, and the young man after 3 or 4 days (he did not seek medical help), after 5 to 6 hours of ambulatory rehydration for the vomiting.

We offer steps in the management of suspected meningococcal infection: sepsis ± meningitis, septic shock and SWF in fig.1.

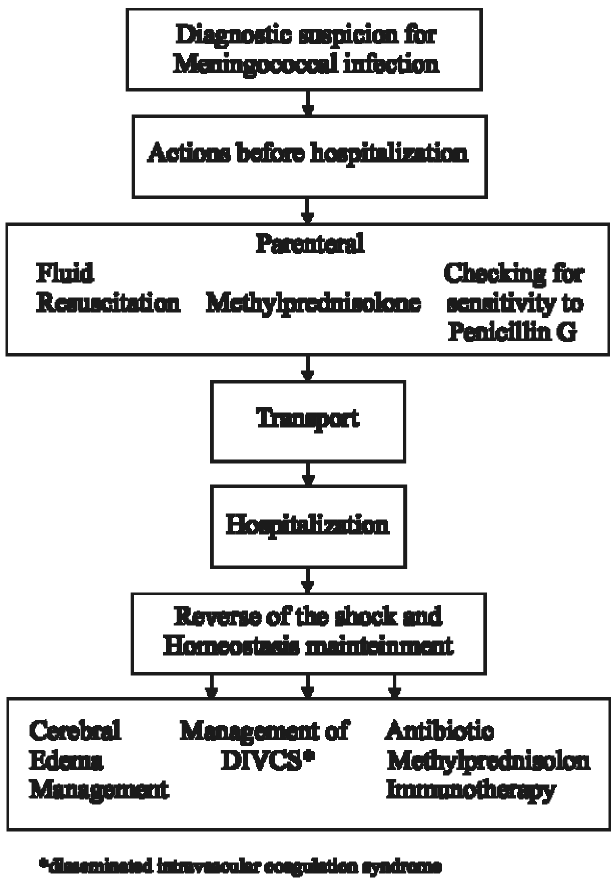

Fig.1. A suggestion for the steps in the management of suspected meningococcal infection: sepsis +/-meningitis, septic shock and SWF.

CONCLUSIONS

1. Delayed diagnosis or unrecognized infectious disease was observed in 15,61% of the investigated group of patients, mostly for the tick-borne spotted fevers.
2. There was a delay of the assessment of the illness severity and the situation of emergency in acute diarrhea in infants. 58,97% of them were referred to a hospital from emergency care units or came unreferred, by their one.
3. There were severe difficulties to provide consultants and laboratory analysis for fast and appropriate diagnosis /papillas' examination, x-ray examination, computer tomography scanning/.
4. 45,45% of the patients with meningitis were treated before admission with antibacterial agents for other diseases, which impede the etiologic diagnosis.

The data from this small and time limited research showed, that the problems in the relations between outpatient and in-patient healthcare in the situations of emergency in infectology area have objective and subjective grounds and have several aspects:

1. Medical
   - Severity and emergencies in the infectious pathology.
   - Unidentified and underestimated need for due hospitalization.
2. Organizational
   - Lack of coordination between the different facilities in healthcare system and unclear definition of their aims between patient's home and the hospital admission.
   - Lack of financial support and poor specialist provided emergency healthcare.
   - Others
3. Social - poor health knowledge of some groups of the population.
4. Necessity of exchange of information between the specialists of different areas of medicine and the different units of public healthcare system for appropriate and fast diagnosos and treatment of the infectious diseases and control of the epidemic process.

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