

MENINGOCOCCAL DISEASE IN THE NORTH – EAST REGION OF ROMANIA

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Abstract. The meningococcal disease represents a priority in epidemiological surveillance; mortality remains high – 10.39 ‰ as well as neurological complications are severe. Since 2006 it had been benefiting by a methodology of surveillance at the national level. **Objective.** The knowledge of the evolutionary specific features of meningococcal disease after the introduction of the standardized surveillance for optimization of control strategies. **Material and methods.** A descriptive study using regional database (EPIDATA) containing meningococcal disease cases reported between 2002 and 2006. The processing and analyzing data was achieved with EPI INFO and Health Mapper programmes. **Results.** The average of incidence rate in the North-East region of Romania, in last 25 years, was equal to 3.4 per 100,000 populations with two epidemical increases: one between 1985 and 1987 – 16.2‰ (in years 1986) and another between 1998 and 1999 – 3.1‰. In the last years (2002- 2006) the average of incidence rate decreased at 1.35‰. The highest incidence rates were observed in the <5 years age group (12.56‰) followed by the 5-9 years age group and 10-14 years age group. The average of mortality was 0.17 ‰ with a case fatality ratio equal to 11.9 %. The highest case fatality ratio was observed in the 0-5 years age group (15.28%) (IC95%:10.08-21.86). The epidemiological indicators of meningococcal disease surveillance evidenced low precocious detection (30.5 %) with the reporting in time of the cases at the Authority of Public Health. **Conclusions.** The meningococcal disease is a priority because of its severity. There are necessary efforts for early detection, reporting in time, optimization of the criterias for confirmation and the introduction of definition of surveillance for invasive meningococcal disease.

Key words: meningococcal disease, epidemiology, standards of surveillance

Rezumat. Introducere. Boala meningococică constituie o problemă de interes major în rândul bolilor transmisibile datorită gravității sale și potențialului epidemiogen. Ea reprezintă o prioritate în supraveghere, motiv pentru care a fost introdusă în lista bolilor cu alertă precoce și răspuns rapid și beneficiază din anul 2006 de o metodologie de supraveghere la nivel național. **Obiective.** Cunoașterea caracteristicilor evolutive ale bolii meningococice în condițiile introducerii supravegherii standardizate în scopul optimizării strategiilor de control. **Material și metode.** S-a efectuat un studiu descriptiv utilizând baza de date regională (EpiData) conținând cazurile de boală meningococică raportate în perioada 2002-2006, urmărindu-se: incidențele săptămânale, lunare, anuale, ale cazurilor compatibile cu definiția de caz; analiza pattern-ului clinic, bacteriologic și epidemiologic al bolii meningococice; evaluarea sistemului de supraveghere prin indicatorii specifici. Prelucrarea și analiza datelor s-a efectuat cu Epi Info 2000 și funcții ale Health Mapper. **Rezultate.** Incidența medie anuală a bolii meningococice în Moldova, a fost în ultimii 25 ani de 3,4‰ cu o creștere epidemică în perioada 1985-1987, cu un apex de 16.2‰ în anul 1987. În perioada 1998-1999 s-a înregistrat o nouă tendință de creștere cu valori mult reduse (3,1‰), pentru ca în intervalul

2002-2006, incidența medie anuală să scadă la 1,35 ‰. Grupa de vârstă cea mai afectată a fost cea sub 5 ani, cu o rată a incidenței de 12,56‰ urmată de grupele 5-9 și 10-14 ani. Mortalitatea specifică medie prin boala meningococică a fost de 0,17‰, cu o rată a fatalității de 11,9%. Rata fatalității a fost mai mare la grupa de vârstă 0-5 ani – 15,28 (IC95%: 10,08-21,86). Indicatorii epidemiologici de supraveghere ai bolii meningococice au evidențiat o depistare precoce redusă 30,5%, cu raportarea în timp optim a cazurilor la ASP. **Concluzii.** Boala meningococică reprezintă o prioritate prin gravitate. Sunt necesare eforturi pentru depistare precoce, raportare în timp util, optimizarea criteriilor de confirmare și introducerea definiției de supraveghere a infecției meningococice invazive.

Cuvinte cheie: boală meningococică, epidemiologie, standarde de supraveghere

INTRODUCTION

The meningococcal disease constitutes a major problem within the framework of communicable diseases because of the sternness (lethality of septicemic forms – 8% (1) and the epidemic potentiality. The meningococcal Serogroups A, C, Y, W135 vaccines reduce the dissemination of the infection. The disease represents a priority in surveillance of diseases and since 2006 it had been benefiting by a methodology of surveillance at the national level.

In 2002, the Institute of Public Health Iași implemented the surveillance methodology at the county level and, after that in 2006 the standardized surveillance of the meningococcal disease was generalized at the national level.

OBJECTIVES

- The knowledge of the evolutionary specific features of meningococcal disease after the introduction of the standardized surveillance.
- The identification of the circulating serogroups meningococcal disease for using the appropriate methods for prophylaxis.

- The assessment of the surveillance system for optimization of control strategies.

MATERIALS AND METHODS

We have realized a descriptive study using regional database (EPIDATA) containing meningococcal disease cases reported between 2002 and 2006. There have been followed up:

- weekly, monthly and annual incidence of cases reported;
- the analysis of clinical, bacteriological and epidemiological pattern of meningococcal disease;
- the assessment of the surveillance system through specific indicators.

The processing and analyzing data was achieved with EPI INFO and Health Mapper programmes.

RESULTS AND DISCUSSION

A. Data concerning the evolution of meningococcal disease for the period 2002-2006 of surveillance

In the period 2002-2005 the average annual incidence rate was 1.97 ‰ and in 2006 was 1.1 ‰ with statistically declining trend compared with the average annual incidence rate in the north-east region of Romania in last 25 years (3.4 ‰). Between

MENINGOCOCCAL DISEASE IN THE NORTH – EAST REGION OF ROMANIA

1985 and 1987 there was an epidemic with an epidemic peaked in 1987 (16.2 ‰).

In the period 1998-1999 there was another trend of the increase of the incidence (3.1‰) and , after that,

in 2002 – 2006, the average annual incidence rate decreased at 1.35 ‰ (fig.1). The European trend of the disease was stable in the last decade, with a declining trend (1).

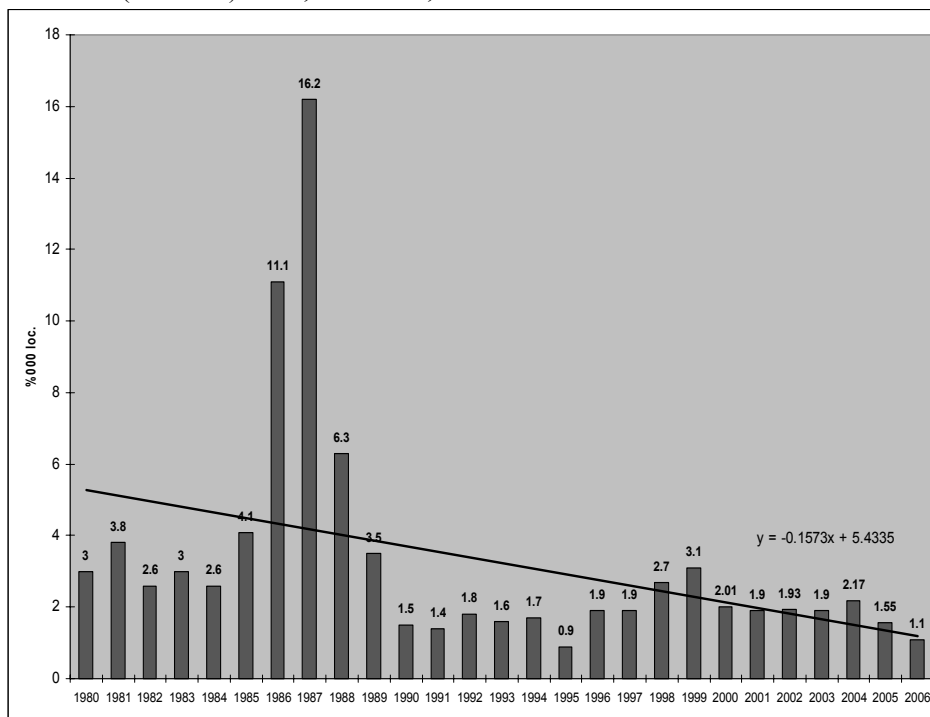


Fig. 1. The multiannual evolution of the meningococcal disease in the north-east region of Romania for the period 1980- 2006.

The monthly progress of the cases joins classical and seasonal evolution with higher values in two periods: February – May and November – December.

The highest incidence rates, the same with European profile, were observed at children under 5 years aged (12.56 ‰) (under 1 year – 32.05‰ and 7.97‰ at 1-4 years aged group)

followed by 5-9 years aged group (1, 4) (fig.2).

The incidence levels were variable by county and by years. In 2005, the higher incidence of meningococcal disease was in Suceava and Vrancea, and in 2006 the higher incidence was in Iasi (fig.3).

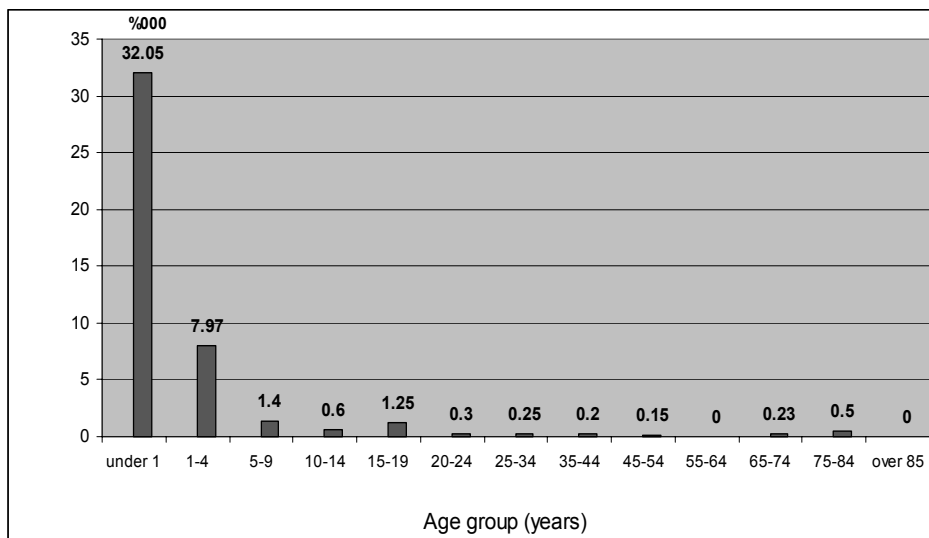


Fig 2. Incidence of meningococcal disease distribution by age group

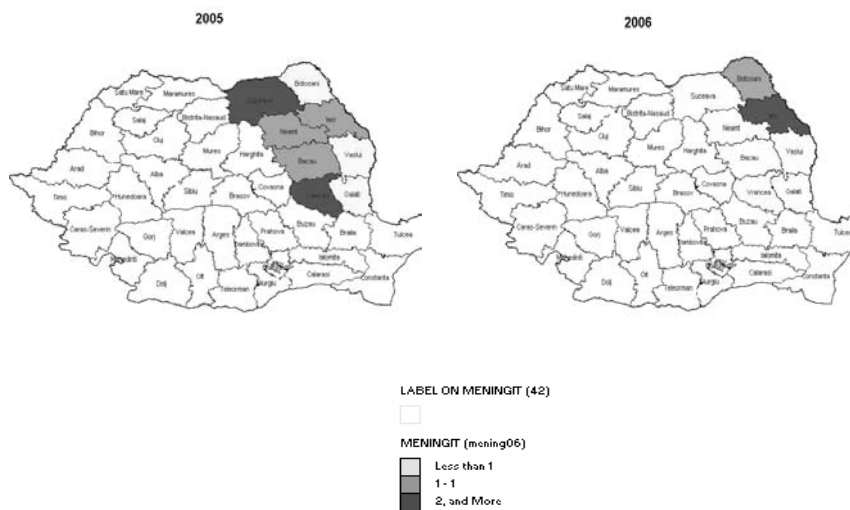


Fig 3. The incidence of meningococcal disease in county of the North-East Region of Romania in 2005 and 2006 years

The average of mortality was 0.17 %000. The higher mortality was in Bacau (14.28 %) followed by the Iasi (13.6%) and Suceava (13.3 %). The

case fatality ratio was equal to 10.29% with the highest value at 0-5 years aged group (13.04 %).

MENINGOCOCCAL DISEASE IN THE NORTH – EAST REGION OF ROMANIA

B. The clinical and bacteriological characterization of the cases

The evolutionary forms of meningococcal disease were represented by the localized form, meningitis and the generalized infection, meningococemia. The weight of invasive infections was 52.4% (IC95%: 46.42-58.50) compared to another countries (2). The clinical evolution was favorable in 82.0 % (IC95%: 69.5-93.7) with a rate of sequelary forms by 2.45 % (IC95%: 0.12-14.5).

The fulminating meningococemia (Waterhouse – Friederichsen syndrome) was 2.6% from all cases.

The weight of confirmed cases was 72.0 % from all reported cases. The bacteriological criterions were represented by: the presence of the diplococci on the Gram colored smear (61.0 %), the isolation of the bacteria (meningococcus) from spinal

fluid/blood (36.8%) and/or the making evident the soluble antigens of *N. meningitidis* with latex agglutination (29.4 %). The suspicious cases include meningococcal invasive infection cases, with a fulminating evolution, which are not effected bacteriological investigations or this are negative. This is one of the actual methodology's limit being necessary the introduction of the definition for confirmation on clinical criterions of the invasive forms.

The circulation of the meningococcus in the North-East Region of Romania area was dominated by serogroup B 67.37% (IC95%: 59.3-74.7), followed by serogroup C 25.53 % (IC95%: 18.7-33.6) and serogroup A 4.86 % (fig.4). These aspects are characteristic for evolution of the disease at the European level. (1, 2, 3).

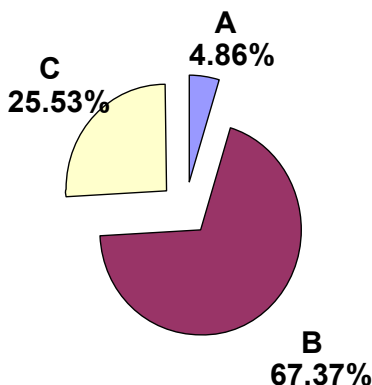


Fig. 4. Distribution of meningococcal serogroups in North East Region of Romania

The knowledge of meningococcal serogroups is important for implementation of the control measures: utilization of the vaccine when there is intensive circulation of the meningococcal serogroup C and only chemoprophylaxis for meningococcal serogroup B.

Also, the clinical features and the gravity of the evolution are directly correlated with the serogroup type because there is well known that serogroup B generates serious forms, especially at children, with a high rate of fatality.

C. Prophylactic activities

Chemoprophylaxis of the contacts is the major measure for stopping the meningococcus spreading in population. The application of the chemoprophylaxis at 87.9% family and collectivities contacts allowed maintaining the morbidity at the sporadic level.

D. The assessment of the surveillance system

The implementation of the surveillance methodology was analysed with surveillance and performance indicators.

1. The epidemiological indicators for surveillance

- Time between onset and handing out: in 58.6% (IC95%: 45.67-70.72) of cases, the detection was made in the first 24 hours after debut of the disease.
- Time between handing out - isolation: in 94.82% (IC95%: 86.56-98.66) of cases, there were isolated in the same day with detection.

2. The performance indicators of the surveillance system.

- The cases were reported at the Authority of Public Health in 79.3% of cases and at the Institute of Public Health in 89.6% (IC95%:79.7-95.7) of cases (table 1).

Table 1. The indicators of the epidemiological surveillance system for meningococcal disease

INTERVAL BETWEEN:	NUMBER OF DAYS						
	0	1	2	3	4	5	> 5 days
Clinical debut and detection	8.5%	61.0%	15.3%	11.9%	1.7%	1.7%	
Clinical debut and isolation	13.6%	55.9%	15.3%	11.9%	1.7%	1.7%	
Detection and isolation	94.9%	5.1%	-	-	-	-	
Detection and reference to the APH	63.8%	15.5%	5.2%	3.4%	5.2%	1.7%	5.2%
Reference to AHP – IPH	1.2%	89.6%	3.4%	2.4%	2.4%	1.0%	

MENINGOCOCCAL DISEASE IN THE NORTH – EAST REGION OF ROMANIA

The indicators under optimal level are: sending in time the surveillance record at the Institute of Public Health (70.7%, IC95%: 58.66-81.24) and the measure of completion (69.0 %, IC95%: 56.24 - 79.24).

CONCLUSION

1. The meningococcal disease is a priority because of the incidence and the mortality.
2. The evolution in the last 5 years was characterized through sporadic cases with the average incidence 1.35 ‰.
3. The most affected group of age is between 0 and 5 years with the incidence 19.45‰ and the case fatality ratio 13.28%.
4. The application of the chemoprophylaxis at 87.9% contacts allowed to maintaining the morbidity at the sporadic level.
5. The standardized surveillance system of the meningococcal disease works at the optimal level.
6. It is necessary to optimize the criterions of confirmation through the introduction of the clinical definition for invasive meningococcal disease.

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