Epidemiological features of Meningococcal infection in Tbilisi

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Abstract

Aim of the study was to identify of epidemiological features of meningococcal infection in Tbilisi in two reporting periods (1992-1999yy and 2017-2021yy). In 1992-1999, the incidence rate reached its maximum in 1993 (2.3 per 100,000 population), and in 2017-2021 it did not exceed one. In the second reporting period in 2020, the maximum rate was recorded in the conditions of the coronavirus pandemic (0.36), which should be due to the prolonged interaction of children with healthy carriers. The age index in both reporting periods is for children aged 0-4 and was 21.4 and 8.81, respectively. Seasonality occurs in winter-spring in the second reference period, although in the first reference period it occurs at all times of the year, which can be explained by the failure of preventive measures in the 90s. The rate of lethality in the first reporting period is almost three times less than in the second reporting period, which may be the reason for not registering deaths in the 90s. We consider it appropriate to introduce vaccination in risk groups.

Introduction

Meningococcal infection is an acute, worldwide distributed infectious disease of bacteriological etiology. Distribution of this disease is different in different regions of the world. There are 500,000-1,200,000 new cases and 50,000-135,000 deaths worldwide each year [1,2].

To date, distribution of the disease in Europe, North America and Australia ranges from 0.3 to 3 cases per 100,000 population [3], whereas in some African countries it can reach 10-1000 cases/100,000 population during epidemics.

Meningococcal infection is characterized by high case fatality rate. 50-80% of untreated cases [4] and 10-15% of treated cases end in death [5].

As in many countries, meningococcal infection is sporadic in Georgia. The prevalence of meningococcal infection in Georgia has decreased dramatically since 2010 and reached a minimum (0.11 per 100,000 population) in 2021 [6].

Despite the downward trend, this disease continues to be a major global public health problem. There is also an effective vaccine, although vaccination against meningococcal infection is not carried out in Georgia, that is why this disease is still relevant for our country.

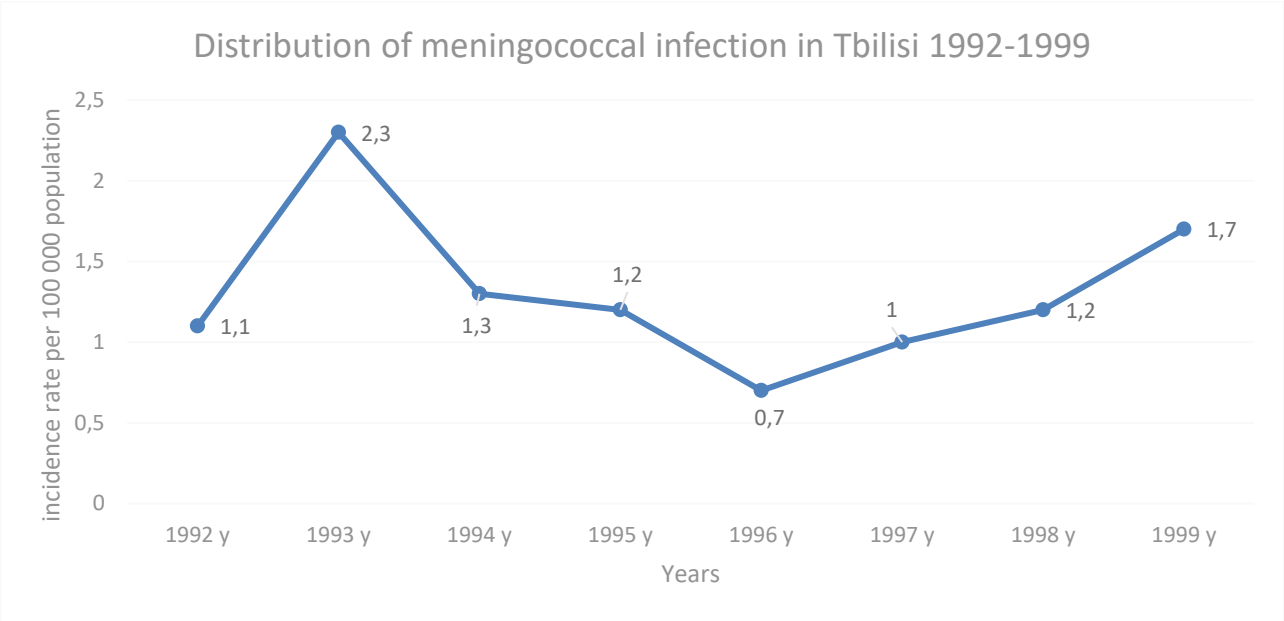
Materials and methods

The data of the National Center for Disease Control and Public Health and the Tbilisi Municipal Center for Epidemic Surveillance and Control of Communicable Diseases were taken as the research material. The retrospective epidemiological method was used to process the data. The materials for two reporting periods (1992-1999yy and 2017-2021yy), were processed.

Results

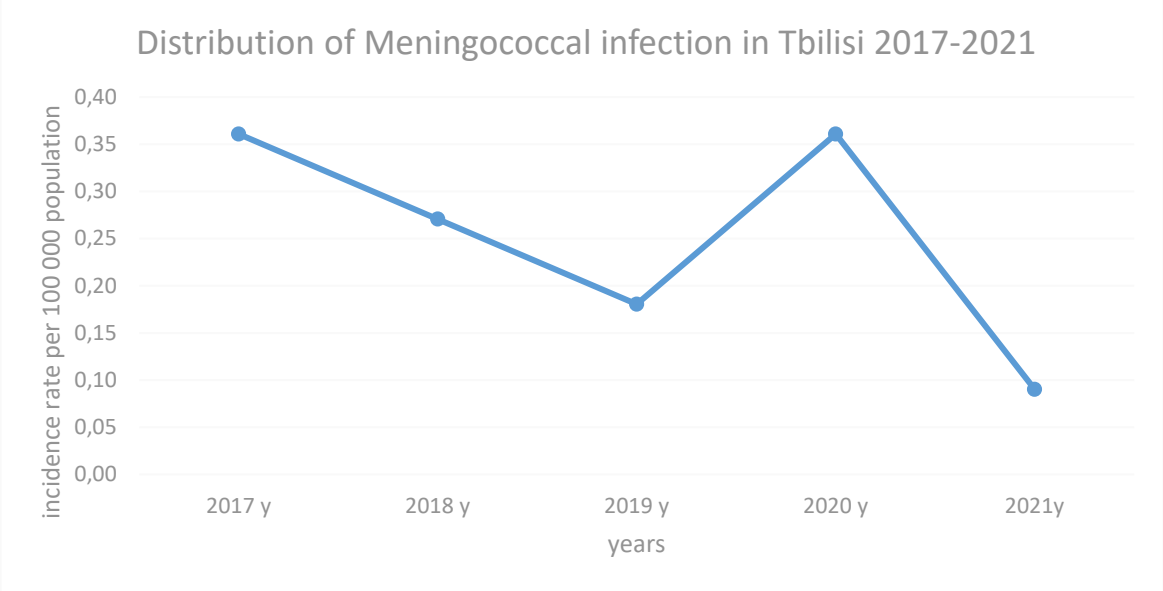
The incidence of meningococcal infection ranged from 0.7 (1996) to 2.3 (1993) in the period 1992-1999, in Tbilisi. A downward trend was recorded in 1993-1996, and since 1997 the rate has been increasing again, which can be explained by improved diagnostics (Figure 1).

Figure 1



In the second reporting period, 2017-2021, the incidence rate of meningococcal infection did not exceed 1 per 100,000 population (Figure 2).

Figure 2



In this reporting period the maximum incidence rate was observed in 2017 (0.36). Also in 2020 the rate of meningococcal infection increased to 0.36 per 100,000 population. Against the background of the introduction of regime - restrictive measures (observation, quarantine, etc.), the increase of this rate should be caused by the increase in healthy carriers, since the majority of sick people are children under the age of 5, and during the pandemic, it was the prolonged relationship with healthy carriers that should have caused the children to become sick, thus increasing the rate.

With the easing of measures in 2021 (observation and quarantine were removed), the rate of the disease has decreased (0.09 per 100,000 population). But, mandatory preventive measures such as social distancing and wearing a mask were observed. Which likely led to a reduction not only in the prevalence of meningococcal infections, but also in respiratory infections in general. This measure reduced not only distribution of meningococcal infection, but also respiratory infections in general.

If we look at the age distribution, we will see that in both reporting periods, the maximum distribution was registered in the age group of 0-4 years and was 21.40 (1996-1999) and 8.81 (2017-2021) per 100,000 population, respectively. It is significantly less in other age groups, in the second reporting period there were no cases in the age groups of 20-49 years, and the minimum rate was observed in the age group over 50 years (Figure 3).

If we consider the seasonality of the disease, we will see that in the second reporting period it exactly repeats the seasonality characteristic of meningococcal infection and reaches its maximum in winter-spring seasons (Figure 4), although in the first reported period it occurs at all times of the year, which can be explained by the reduction of preventive measures in the 90s .

Figure 3

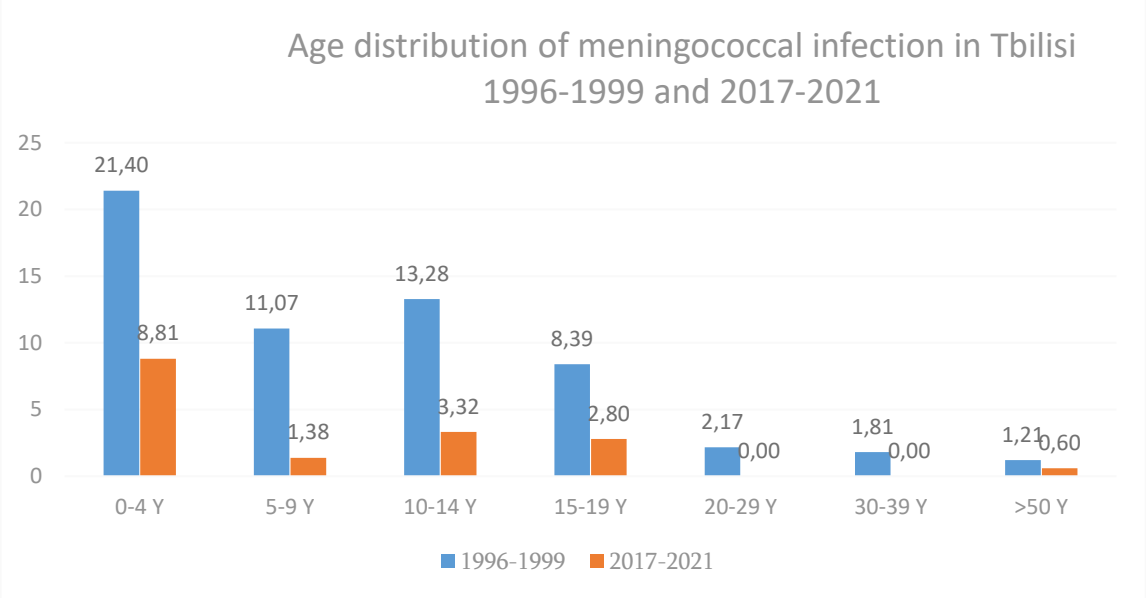
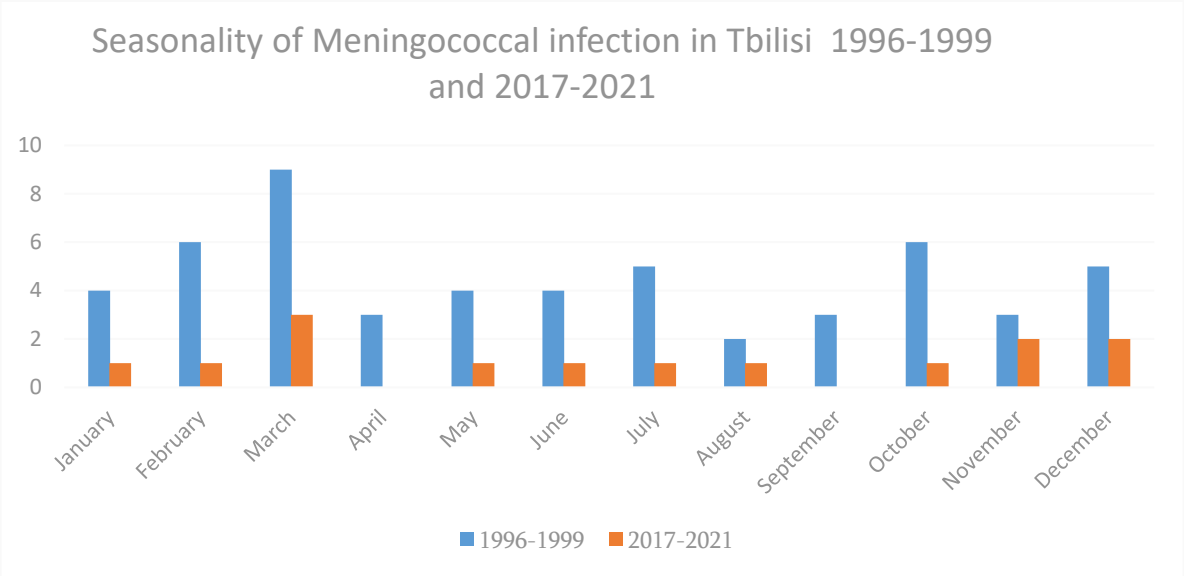


Figure 4



Meningococcal infection case-fatality rate in Tbilisi is noteworthy. In 1996-1999, it was 7.4%, and in 2017-2021, it almost tripled and reached 21.4%. These figures seem unusual in an era of improved surveillance and treatment, but may be due to underreporting of deaths in the 1990s. In the second reporting period, 67% of deaths occurred in people aged 50 and older.

Conclusion

The obtained results were an attempt to describe the epidemiologic characteristics of meningococcal infection in Tbilisi. This issue needs deeper research.

Recommendations

Despite the sporadic distribution of the disease in the country, we consider it advisable to introduce vaccination in risk groups - in children group and in the elderly group.

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