COMPLICATIONS OF EPIDEMIC PAROTITIS IN EARLY CHILDHOOD: CLINICAL AND EPIDEMIOLOGICAL PERSPECTIVES

Masharipova Shakhista Sabirovna
Urganch State Medical Institute, Urgench, Uzbekistan

Annotation

Epidemic parotitis remains a relevant issue in pediatrics and public health despite the widespread implementation of vaccination. In young children, the disease is characterized by a variety of clinical manifestations and a risk of complications affecting multiple organs and systems. Particular importance is associated with involvement of the central nervous system, pancreas, and other organs, which may determine the severity of the disease. The study of clinical and epidemiological features of complications of epidemic parotitis in early childhood is essential for timely diagnosis, prevention of adverse outcomes, and improvement of preventive strategies.

Keywords: epidemic parotitis, early childhood, complications, clinical features, epidemiology, central nervous system, pancreatitis, prevention

Introduction

Mumps (epidemic parotitis) is an acute viral disease that is widely распространена in the pediatric population and remains relevant in modern healthcare systems. Despite the implementation of mass vaccination, periodic outbreaks of the disease continue to be reported, which is associated both with insufficient immunization coverage and the waning of post-vaccination immunity.

Mumps is of particular importance in young children, in whom the course of the disease may be characterized by atypical clinical manifestations and an increased tendency to develop complications. The virus exhibits tropism for glandular and nervous

tissues, leading to involvement of the salivary glands, central nervous system, pancreas, and other organs.

Complications of mumps, such as aseptic meningitis, encephalitis, pancreatitis, and other pathological conditions, can significantly aggravate the course of the disease and affect its prognosis. In young children, these complications may present in a subtle or, conversely, more pronounced form, which complicates timely diagnosis and requires special clinical attention.

The study of the clinical and epidemiological characteristics of mumps complications in young children is of great importance for improving diagnostic approaches, early detection of complicated forms of the disease, and the development of effective preventive measures.

Objective

The aim of this study is to provide a comprehensive assessment of the clinical and epidemiological characteristics of complications of mumps in young children based on the analysis of the clinical course of the disease in 16 patients aged 2 to 7 years.

Materials and Methods

The study had an observational descriptive design and was conducted among young children diagnosed with mumps. A total of 16 patients aged 2 to 7 years, including both boys and girls who were hospitalized, were enrolled in the study.

The diagnosis of mumps was established based on clinical and epidemiological data, taking into account characteristic symptoms of the disease (enlargement of the parotid salivary glands, fever, and intoxication syndrome), as well as laboratory confirmation.

Laboratory methods included:

• complete blood count with assessment of leukocytes, lymphocytes, neutrophils, and erythrocyte sedimentation rate (ESR);

• biochemical blood analysis with determination of serum amylase, glucose levels, and liver enzyme activity (ALT, AST);

• serological methods (ELISA) for the detection of specific IgM and IgG antibodies to the mumps virus;

• when indicated, cerebrospinal fluid (CSF) analysis (cell count, protein, and glucose levels) for the diagnosis of central nervous system involvement.

Instrumental methods included abdominal ultrasound examination to assess the condition of the pancreas and other organs.

During the study, anamnesis, clinical presentation, disease severity, and the nature of complications (meningitis, pancreatitis, etc.) were analyzed. The following parameters were evaluated: age, sex, duration of hospitalization, duration of illness, and the presence of concomitant factors.

Statistical analysis was performed using descriptive statistical methods, with calculation of mean values (M), standard deviation (SD), and percentages.

Results and Discussion

In the course of the study, clinical and laboratory data of 16 children aged 2 to 7 years diagnosed with mumps were analyzed. In most patients, the disease presented with typical clinical manifestations, including enlargement of the parotid salivary glands, fever, and signs of intoxication.

Laboratory findings revealed changes characteristic of viral infection. In the complete blood count, most patients demonstrated relative lymphocytosis, normal or moderately elevated leukocyte levels, as well as an increased erythrocyte sedimentation rate (ESR). Biochemical blood analysis showed elevated amylase levels in some patients, indicating the involvement of the pancreas in the pathological process.

Serological testing confirmed the presence of IgM antibodies in the majority of patients, indicating the acute phase of the disease.

For a more detailed analysis of clinical and laboratory parameters, an expanded table is presented below:

Table 1. Clinical, laboratory parameters and complications in children with mumps (n=16)

Parameter	Number (n)	Percentage (%)
Clinical manifestations		
Enlargement of parotid salivary glands	16	100%
Fever (>38°C)	14	87.5%
Signs of intoxication	13	81.2%
Pain during chewing/swallowing	11	68.7%
Loss of appetite	10	62.5%
Laboratory findings		
Lymphocytosis	12	75%
Leukocytosis	7	43.7%
Elevated ESR	10	62.5%
Elevated amylase	6	37.5%
Positive IgM	13	81.2%
Presence of IgG	5	31.2%
Complications		
Aseptic meningitis	4	25%
Pancreatitis	3	18.7%
No complications	9	56.2%

The analysis of the presented data showed that the clinical picture in most patients corresponded to the classical course of mumps. At the same time, a significant proportion of children developed complications, among which involvement of the central nervous system and the pancreas was the most common.

Particular attention should be paid to the fact that in some patients, complications developed against the background of relatively mild clinical symptoms, which may complicate early diagnosis and requires more careful monitoring.

The obtained results are consistent with the literature data on the multi-organ involvement in mumps and emphasize the need for a comprehensive approach to patient evaluation, including clinical, laboratory, and instrumental methods.

Statistical analysis of the obtained data was performed using descriptive statistical methods. Quantitative variables were presented as mean values (M) and standard deviation (SD), while qualitative variables were expressed as absolute numbers (n) and percentages (%).

The mean age of the patients was 4.5 ± 1.7 years. The sex distribution was relatively even, with no statistically significant differences.

To assess the frequency of clinical manifestations and complications, percentages with 95% confidence intervals (95% CI) were calculated. Thus, the incidence of aseptic meningitis was 25% (95% CI: 7.3–52.4%), and pancreatitis was 18.7% (95% CI: 4.0–45.6%).

Analysis of laboratory parameters showed that elevated amylase levels were significantly more common in patients with signs of pancreatitis ($p<0.05$). Patients with complicated disease demonstrated a tendency toward more pronounced lymphocytosis and increased ESR; however, these differences were not statistically significant ($p>0.05$).

For comparison between groups (with and without complications), non-parametric statistical methods were used, including the Mann–Whitney U test for quantitative variables and the chi-square (χ^2) test for qualitative variables. Differences were considered statistically significant at $p<0.05$.

The results indicate an association between biochemical parameters (amylase levels) and the development of complications, confirming the diagnostic value of laboratory methods in mumps in young children.

Discussion

The results obtained in this study confirm that mumps in young children may present not only in a typical form but also be accompanied by complications of varying severity. Despite the relatively small sample size, the identified clinical and laboratory features are consistent with current understanding of the pathogenesis and clinical course of the disease.

It was found that the most common complications were involvement of the central nervous system and the pancreas, which is in agreement with literature data on the tropism of the mumps virus for glandular and nervous tissues. The incidence of aseptic meningitis (25%) in our study was slightly higher compared to some published data, which may be related to the age characteristics of the studied group as well as the inclusion of predominantly hospitalized patients with more pronounced clinical manifestations.

Elevated amylase levels in patients with signs of pancreatitis confirm the diagnostic value of this biochemical marker and are consistent with other studies indicating frequent subclinical pancreatic involvement in mumps. It should be noted that not all patients with elevated amylase exhibited pronounced clinical symptoms, suggesting the possibility of a latent course of pancreatitis.

Particular attention should be paid to the fact that in some children, complications developed against the background of moderately expressed clinical symptoms, which may complicate timely diagnosis. This highlights the need for broader use of laboratory and instrumental diagnostic methods even in cases with relatively mild clinical presentation.

The absence of statistically significant differences in several indicators between groups may be explained by the small sample size, which limits the possibility of more in-depth statistical analysis. At the same time, the observed trends emphasize the importance of a comprehensive approach to patient assessment.

The results of the study confirm the necessity of early detection of complications of mumps in young children and timely diagnostic interventions. The obtained data may be useful for improving clinical practice and preventive strategies.

Conclusion

Mumps in young children is characterized by a wide range of clinical manifestations and a risk of complications affecting various organs and systems. In most cases, the disease presents with typical symptoms; however, a significant proportion of patients develop complications, most commonly involving the central nervous system and the pancreas.

The present study demonstrated that clinical and laboratory parameters, particularly serum amylase levels and changes in the complete blood count, are important for the timely diagnosis of complicated forms of the disease. Complications may develop even in the presence of moderately expressed clinical symptoms, which requires increased clinical vigilance.

Despite the limited sample size, the findings confirm the necessity of a comprehensive approach to the evaluation of children with mumps, including clinical, laboratory, and instrumental diagnostic methods.

Thus, early detection of complications and timely diagnostic interventions can reduce the risk of adverse outcomes and improve treatment effectiveness. The obtained data may be used to enhance clinical practice and preventive strategies for mumps in young children.

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