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INCIDENCE OF MENINGOCOCCAL DISEASE IN THE COVID-19 & POST-COVID-19 ERA

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Relevance. Meningococcal disease is a disease with high-fatality rate caused by *Neisseria meningitis*. We have noted a lack of data on the disease burden during the time of the COVID-19 pandemic and the post-COVID-19 era in the city of Minsk, Belarus. This article details the results of the analysis of this data to aid appropriate preventive and therapeutic actions.

Aim: to present the incidence of meningococcal disease in the post-COVID-19 era in the city of Minsk, Belarus.

Materials and methods. Patient case histories diagnosed with meningococcal disease in the Minsk City Infectious Disease Hospital during the period 2020 to date were obtained. Scientific articles from PubMed and Google Scholar in the time period 2014-2024 were analysed.

Results and their discussion. 13 cases of meningococcal disease were obtained from which 1 case with meningococcal nasopharyngitis was eliminated from analysis. Of the remaining patient (n=12), 9 (75%) had a diagnosis of meningococcal meningitis, out of which 6 (50%) had both meningococemia and meningitis. The remaining patients (25%) had only meningococemia. and The patients had a mean age of 39.5 ± 16.5 years, 8 female and 4 male.

Analysis of the complete blood counts on day 1 revealed a mean white blood cell count (WBC) of $11.45 \pm 5.46 \times 10^9/l$, red blood cell count (RBC) of $3.79 \pm 0.6 \times 10^{12} /l$ and a platelet count of $137.17 \times 10^9/l$. The inflammatory markers on day 1 were also assessed where the erythrocyte sedimentation rate (ESR) had a median of 31.5 mm/h (IQR = 38.25), the C-reactive protein (CRP) had a median of 189.99 mg/l (IQR = 188.22) and procalcitonin with a median of 10 ng/ml (IQR= 17.33) were obtained.

To understand the relationship with age and the severity of the disease, the inflammatory markers and the age of patients were individually compared. The Spearman's correlation between the CRP level on day 1 and the age of the patient was $p = -0.634$ indicating a moderately-strong negative correlation. The correlation analysis between ESR on day 1 and age was $p = 0.0418$, and between procalcitonin and age was 0.036.

The results of cerebrospinal fluid analysis in patients who had this data were assessed. This revealed a median CSF cell count (n=10) of $37.92 \times 10^6/l$ (IQR = 144.5), a mean CSF glucose (n=9) of 2.62 ± 1.28 nmol/l, a median CSF protein (n=9) of 0.46 g/l (IQR = 1.19) and a median CSF lactate (n=8) of 2.66 mmol/l (IQR = 5.035). To evaluate the correlation between age and CSF glucose level on day 1 in meningitis-positive patients, the Spearman's correlation analysis was done yielding a result of $p = -0.334$, indicating a moderate negative relationship. Similarly the correlation between age and CSF lactate on day 1 revealed a moderate positive relationship ($p = 0.395$).

In the aspect of management all patients received an antibiotic regimen of ceftriaxone. Additional antibiotics included vancomycin (23%), ciprofloxacin (15%), azithromycin (8%), cotrimoxazole (23%), meropenem (23%), levofloxacin (8%), linezolid (8%). 9 patients (75%) were administered corticosteroids (8 dexamethasone only, 1 dexamethasone + hydrocortisone) and 5 patients required vasopressors (4 norepinephrine only, 1 norepinephrine + dobutamine).

With regards to mortality, only one patient died in the analysed time period following multiple organ failure and cerebral oedema.

Conclusion. This analysis provides extensive data on the incidence of meningococcal disease, the associated changes in inflammatory markers and CSF analysis as well as the treatment regimen and mortality. Further comparison with data in the pre-COVID-19 period is warranted to evaluate any effects the COVID-19 infection on incidence, prevalence and severity of meningococcal disease.