**Clinical characteristics of patients diagnosed for COVID-19 in a pulmonary hospital in the first three months of the epidemic in Poland.**

**Charakterystyka kliniczna pacjentów diagnozowanych w kierunku COVID-19 w szpitalu pulmonologicznym w pierwszych trzech miesiącach trwania epidemii w Polsce.**

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Streszczenie

W okresie pierwszych trzech miesięcy trwania epidemii wykonano testy w kierunku COVID-19 u 200 pacjentów przyjętych ze wskazań nagłych. Dodatni wynik testu uzyskano u 15 chorych. U pacjentów z dodatnim wynikiem testu znamiennie częściej występowała gorączka, częściej mieli dodatni wywiad epidemiologiczny, limfocytopenię oraz obecne zmiany śródmiąższowe w badaniach obrazowych. W grupie tej obserwowano nieznamiennie statystycznie niższe wartości leukocytozy, CRP i PCT.

Abstract

During the first three months of the epidemic, tests for COVID-19 were performed in 200 emergency patients. Positive result was obtained in 15 patients. Patients with a positive test had a significantly higher incidence of fever, more often had a positive epidemiological history, lymphocytopenia and current interstitial lesions in imaging tests. In this group, lower, but statistically insignificant, values of leucocytosis, CRP and PCT were observed.

Słowa kluczowe: COVID-19, SARS-CoV-2, charakterystyka kliniczna

Key words: COVID-19, SARS-CoV-2, clinical characteristics

Introduction

In the second half of February 2020, when the first cases of SARS-CoV-2 infection were found in Europe, hospitals faced te need to implement procedures to effectively identify and isolate infected patients. Te first case in Poland was confirmed on 04/03/2020. Lack of characteristic signs of infection and high infectivity pose a risk of epidemic outbreaks involving staff and other patients. In Poland, a network of hospitals dedicated to the treatment of patients with COVID-19 has been created, however, each healthcare facility must be prepared for the appearance of a patient with SARS-CoV-2 infection and have to develop methods for identifying infected or suspected persons and protecting personnel and other patients. Our Center is a hospital dedicated to patients with respiratory diseases. The hospital has a pavilion construction and contains 176 beds. The Center has three pulmonology wards, an internal medicine ward, a chest surgery ward and a 5-bed intensive care unit. In the analyzed period, te pavilion dedicated to patients with tuberculosis, ensuring the most effective isolation options, was renovated (planned to be restarted in August 2020). The Center has an Infection Control Team, wich prepared information, recommendations and procedures to prepare the Center for a new threat. In cooperation with the management and departments managers, a system was implemented to quickly identify patients with a positive epidemiological history and/or symptoms suggestive for SARS-CoV-2 infection and isolate all suspected patients. For this purpose an „isolation ward” was created for patienst with a mild course od disease, and part of one of the pulmonary wards was adapted for the isolation of patients requiring high-flow oxygen therapy or non-invasive ventilation. Dedicated staff trained in the use of personnal protective equipment worked in these areas. The preparations also included the intensive care unit, where it was possible to prepare additional beds and trained staff. The aim of the study is to present the clinical characteristics of patients diagnosed in our Center for COVID-19 infection in the first three months of the epidemic in Poland with an indication of clinical differences between patients with positive and negative RT-PCR test results for SARS-CoV-2.

Material and methods

The presence of any symptoms indicating respiratory infection, including fever, cough and shortness of breath, was considered as indications for diagnostic for SARS-CoV-2 infection, regardless of the epidemiological history collected. The RT-PCR tests was also performed in patients admitted for other symptoms if the epidemiological history indicated possibility of contact with an infected person or in the case of the presence of interstitial changes in lung imaging. In the analyzed period RT-PCR tests for SARS-CoV-2 were performer in four different laboratories, and the waiting time for the results varied from one to five days. The Infection Control Team collected the following data for each patient who was examined: age, gender, epidemiological history, respiratory symptoms, accompanying diseases that may give symptoms as fever, cough, shortness of breath, imaging results, leucotytosis, lymphocytosis, C-reactive protein (CRP) and procalcytonin (PCT) level on admission, RT-PCR result. Free calculators (Student’s t-test and chi-square) avaible on the <https://www.socstatistics.com/> platform were used for statistical calculations. Feedback was provided to personnel twice a week regarding the numer of tests performed, their results, and the characteristics of the patienst being diagnosed. A consilium was established to jointly decide on the repetition or termination diagnostics and isolation in selected, unclear cases.

Results

During the first three months of the epidemic in Poland (from 04/03 to 04/06/2020), in our Centre 221 RT-PCR test for SARS-CoV-2 were performed on 200 patienst admitted for emerging reasons. No secondary infection were reported among staff or nosocomial infections SARS-CoV-2 among other patiens. The patiens age was 21-95 years (average 68 years), men constituted 60,5% (121 people). The most frequently reported complainst were shortness of breath (121 patiens, 60,5%), fever (98 patients, 49%) and cough (84 patienst, 42%). An epidemiological interview in 17 people indicated the possibility of contact with a person infected with COVID-19, in 53 patients the epidemiological history was defined as „unclear”, „impossible to collect” or no epidemiological history was documented. Imaging tests were performed for 174 patients (87%), including chest X-ray in 174 patients (87%) and chest CT in 75 patienst (37,5%). The presence of lesions described by the radiologist as „interstitial” was found in 72 X-ray examinations (41,4% of performed) and in 26 CT examinations (34,6% of performed). On admission, the mean leucocyte level was 10.7 x 109 /L. Lymphocytopenia (< 1 x 109 /L) was observed in 101 patients (51,5%). CRP levels were determined on the day of admission in 193 patients. The mean value was 72.3 mg/L (range 0-443,35 mg/L). PCT levels were determined on the day of admission in 135 patients. The mean value was 1.93 ng/L (range 0-43 ng/L). A combination of elevated (> 5 mg/L) CRP and low (< 0,2 ng/L) PCT levels was found in 60 patients. 79 patients (39.5%) has at least one previously diagnosed condition that could be responsible for the reported symptoms, most often COPD, cancer, circulatory failure or asthma. Positive RT-PCR for SARS-CoV-2 was obtained in 15 patients (7.5%). Table 1 compares the parameters of patients with positive and negative tests results. Patients with a positive RT-PCR test for SARS-CoV-2 were statistically significantly older, significantly more often had a positive epidemiological history, more often had a fever or subfebrile condition at admission, lymphocytopenia and interstitial changes were found more frequently in imaging tests. Patients who were not confirmed to have COVID-19 infection were more likely to have other conditions that could be responsible for the reported symptoms. Lower leucocytosis, CRP and PCT values were observed in the group with positive coronavirus test, but these differences were not statistically significant.

Discussion

The emergence of a new contagious disease, COVID-19, has proved to be a major challenge for te global health care system. Hospitals faced the need to develop rules for the identification and isolation of patients suspected of being infected having incomplete knowledge of the properties of the virus, routes of transmission and the spectrum of symptoms caused. According to the results of the PPS study, the availability of isolation rooms in Polish hospitals is lower than in other European Union countries [1]. In our Center, the pavilion best adapted to the isolation of patients (used for hospitalization of patients with tuberculosis), was closed during the described period due to renovation, which required adaptation of other areas of the hospital to isolate more patients. SARS-CoV-2 infection causes a whole spectrum of clinical symptoms ranging from scantly (or even asyptomatic) cases to those with respiratory failure. The most commonly reported symptoms are fever, cough, shortness of breath, myalgia and fatigue [2]. Diarrhea, taste and smell lost, skin changes are less frequently recorded [3,4]. Attention is drawn to the high sensivity of imaging tests with their relatively low specifity [5], as well as the diagnostic and prognostic significance of lymphocytopenia and the values of CRP and PCT [6]. In Poland, the criteria for a case suspected of being infected with a new coronavirus, taking into account the clinical picture and epidemiological circumstances, are published by the Główny Inspektorat Sanitarny (<https://gis.gov.pl>). The absence of pathognomonic signs of infection and the high risk of transmission of infection to staff and other patients justify performing RT-PCR tests for SARS-CoV-2 in all patients with signs of respiratory infection. Detailed diagnostic guidelines for COVID-19 have been published by the Infectious Diseases Society of America [7]. According to literature data and experience acquired at our Center indicates the importance of epidemiological history and high sensitivity, but the lack of specificity of symptoms such as lymphocytopenia or the presene of interstitial abnomalities in imaging studies. Patients with a posistive test for new coronavirus were significantly older than the patient population with a negative test result. This is propably due to the presence of epidemic outbreaks in nearby long-term facilities, where some patients came from in the analyzed period of the epidemic. The presence of other condition that may cause fever, cough or shortness of breath reduced the likelihood of diagnosis COVID-19, but does not relive the patients for testing.

Piśmiennictwo

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