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Infection and Febrile Neutropenia Management in Patients

Aman Mathur* **and Shreya Singh**

Department of Biochemistry, Microbiology and Immunology, Chandigarh University, Punjab, India

Abstract

The main factors to be taken into consideration when evaluating patients with solid cancer and infectious diseases have been reviewed in this paper by a group of experts from the Spanish Society of Infectious Diseases and Clinical Microbiology (SEIMC) and the Spanish Society of Medical Oncology (SEOM). A number of recommendations have been made about the use of vaccines, the management of vascular catheter infections, and the prevention of infections prior to specific surgical procedures, among other topics. Additionally, the standards for treating non-ebrile neutropenia and using colony stimulating factors were updated. They conclude by offering a number of suggestions for the care of cancer patients who have serious infections.

Keywords: Cancer • Patients • Infection • Significant improvements • Complications

Introduction

There have been significant improvements in cancer patient care during the past 20 years. The decrease in morbidity and mortality from infectious complications as a result of the advancements made in the prevention and treatment of these infections, as well as a reduction in the length of neutropenia due to the use of haematopoietic growth factors, have unquestionably been among the most notable.

Infectious complications remain one of the leading causes of death in cancer patients despite these advancements. Due to surgery, the use of venous or urinary catheters and other devices, as well as the procedures they receive, these individuals are more likely to get nosocomial infections and have a higher risk of having certain illnesses reactivate. The development of multidrug resistant germs in recent years has made it challenging to treat these patients with antibiotics. Additionally, the frequency with which novel monoclonal antibodies and biological treatments are used has raised the possibility that these patients will develop a variety of serious illnesses [1,2].

Although there are many clinical recommendations for individuals with haematological disorders, there aren't many that particularly address those who have solid tumours. As a result, experts from the Spanish Society of Infectious Diseases (SEIMC) and the Spanish Society of Medical Oncology (SEOM) have made the decision to create this document, which reviews the current research on the subject and offers a number of recommendations based on the best available evidence. The document is intended for use by oncologists and infectious diseases specialists in routine clinical practise.

Literature Review

First cancer patient

The goal of the initial evaluation of cancer patients is to identify any active or dormant infections that could become active again in those with a solid malignancy who will soon begin immunosuppressive treatment [3].

A thorough epidemiological history, including contact with patients who have an infectious disease as well as other immune compromised patients, should be included in the clinical assessment. The patient's origin and stays or travels to foreign countries with endemic diseases that could potentially be reactivated should also be considered. Along with Human Papillomavirus (HPV) screening, women should also be urged to have a gynaecological exam.

Depending on the type of chemotherapy used as well as the unique immunosuppression risk for each cancer patient, the initial microbiological examination is designed to screen for the major chronic or latent infections that may become reactivated in the case of immunosuppression in the patient. Serological testing for the following viruses would be helpful in certain circumstances [4], depending on the treatment and immunosuppression risk: Hepatitis A, B, and C (HAV, HBV, and HCV); Varicella Zoster Virus (VZV); and Human Immunodeficiency Virus (HIV). Additionally, in all individuals with a suspected history of the disease, the presence of latent Tuberculosis (TB) should be ruled out using a Mantoux test and/or an Interferon Gamma Release Assay (IGRA).

***Address for Correspondence:** Aman Mathur, Department of Biochemistry, Microbiology and Immunology, Chandigarh University, Punjab, India; E-mail: mathur.aman88@yahoo.com*

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Infection prevention

A yearly flu shot is advised for people who have active solid tumours and those receiving chemotherapy. In accordance with the recommendations made for immunocompromised patients, vaccination against pneumococcus is advised for patients. A booster dosage of tetanus-diphtheria is advised based on the aforementioned factors (chemotherapy kind and duration, patient's clinical condition). Tetanus diphtheria pertussis vaccination is advised for patients who have not received the whooping cough vaccine (Tdap). In the same way, if there is a clear indication, immunisation against HPV, meningococcus, and HAV should be taken into consideration. After assessing the serological and clinical state of unvaccinated patients, the administration of the HBV vaccination should be taken into consideration [5,6].

The recommended vaccinations should be given to patients prior to starting chemotherapy. While live attenuated vaccines should be administered at least four weeks before starting treatment, inactivated vaccines should be administered at least two weeks before the start of treatment (with the exception of the flu vaccine, which will be administered annually, even during the chemotherapy regimen).

HBV screening is crucial in patients who are considered high risk (such as those on everolimus, temozolomide, rituximab, etc.) and should be taken into consideration in other patients, based on medical judgement. Hepatitis B surface antigen (HBsAg), hepatitis B core antibody (anti-HBc), and hepatitis B surface antibody will be used for screening (anti-HBs) [7]. If they're all negative, there isn't an infection, then the patient needs to get immunised before starting immunosuppressive medicine. The research should be finished with the assessment of the viral load, e antigen (HBeAg), liver function tests, and, if necessary, a liver biopsy if a patient tests positive for HbsAg.

It is possible to tell from the results if the patient has chronic hepatitis, is at the immunotolerant stage, or is an inactive HBV carrier. The patient should undergo entecavir or tenofovir antiviral medication if they have chronic hepatitis. The patient has to undergo antiviral prophylaxis in the other two situations. Given that the viral load is positive and the illness is occult, the patient needs prophylaxis. If the viral load is negative, the potential for reactivation should be monitored on a regular basis while receiving immunosuppressive therapy in order to detect it early and start treatment as soon as feasible. This monitoring will be carried out by measuring the viral load, HbsAg, and/or liver biochemistry. Most authors agree that a prophylactic programme should be started right away in high risk patients.

Gram negative enteric bacilli and enterococci should be covered by prophylactic antibiotic therapy in cases of Endoscopic Retrograde Cholangiopancreatography (ERCP), as full biliary drainage may not be possible in patients with blockages. If the operation does not clear the obstruction, it is advisable to continue taking antibiotics. Antibiotics (cefazolin, 1 g IV; 30 min before the surgery) have been shown to dramatically lower the risk of infection during Percutaneous Endoscopic Gastrostomies (PEG).

Discussion

Patients with FN experience an infection incidence of 25-30%, and death might reach 11% in some populations. The overtreatment of low-risk events is widespread since this risk is not uniform. Predicting the likelihood of major consequences and, consequently, the necessity for hospital admission and parenteral medication is the goal of assessing the infection risk in these patients. The initial evaluation should include the evaluation of the following:

- Systemic inflammatory response data, by checking vital signs like temperature, heart rate, and respiratory rate.
- Severe sepsis data, by looking for hypotension, signs of tissue hypo-perfusion, or acute organ dysfunction.
- Presence of primary or secondary infection foci, by taking the clinical and epidemiological context into consideration.

An individual assessment is advised if the estimated risk is between 10% and 20%. G-CSF administration is primarily taken into account in high risk patients, such as those over 65 with a history of FN, extensive bone marrow involvement, or who have recently undergone extensive surgery, particularly if this involved an intestinal resection, in order to avoid delays and dosage reductions [8]. In patients with severely advanced tumours, frail general or nutritional state, significant comorbidities, or in those in whom the effectiveness of chemotherapy and sustaining dose intensity is questionable, the use of prophylactic therapy is more debatable. Except in certain instances, routine G-CSF treatment is not advised in patients with a risk below 10%.

Conclusion

Only solid cancer patients taking chemotherapy regimens that cause deep and sustained neutropenia would be in need of reverse isolation measures. Reverse isolation rooms must meet a number of unique requirements that limit environmental contamination by circulating air that has been stripped of germs and obstructing the entry of microorganisms into the room using positive pressure.

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