Universidad Zaragoza

Academic Year: 2024/25

66154 - Biomarkers, toxicities and response evaluation in oncoimmunology

Teaching Plan Information

Academic year: 2024/25
Subject: 66154 - Biomarkers, toxicities and response evaluation in oncoimmunology
Faculty / School: 104 - Facultad de Medicina
Degree: 637 - Masters degree in Tumor Immunology and Cancer Immunotherapy
ECTS: 6.0
Year: 1
Semester: First semester
Subject type: Compulsory
Module:

1. General information

In immuno-oncology, biomarkers play a crucial role in the assessment of treatment response and prediction of toxicities. Biomarkers can be measurable molecules or characteristics that are used to identify the presence, prognosis or response to treatment of a cancer.

It is essential to know the techniques and criteria for evaluation (iRECIST) of the radiological response in immuno-oncology. Imaging methods such as computed tomography (CT), magnetic resonance imaging (MRI), or nuclear medicine techniques (PET) are used to assess the reduction in tumour size and metabolic activity in response to treatment. The phenomena of pseudo progression and hyper progression will be discussed and radiological images of immunorelated toxicity will be analysed.

Immunorelated side effects will be systematically reviewed, with emphasis on the different clinical guidelines. The learning needs of healthcare professionals (nurses, emergency services, family physicians, etc.) to become familiar with this new type of toxicity, as well as the multidisciplinary coordination needed to properly care for patients with severe side effects of immunotherapy will also be discussed.

2. Learning results

The student, in order to pass this subject, must demonstrate the following results:

1.- To know the most used diagnostic procedures in oncology.
2.-To know the meaning and the different systems of assessment of the response and quantification of the symptoms by means of visual scales and questionnaires centred on the patient, in order to be able to assess the evolution of the disease in response to the different treatments.
3.-To interpret the necessary complementary tests to establish the differential diagnosis between different clinical situations and plan the therapeutic strategy.
4.- To know the different systems of response assessment in immunotherapy.
5.- To recognize the occurrence of pseudo progression and hyper progression phenomena and know how to deal with them.
6.- To know the usual toxicity (frequency and chronology of presentation) of the different drugs and combinations used in immunological treatment.
7.-To understand the importance of planning, communicating and informing the patient about the different side effects, in order to anticipate their appearance and recognize them in early stages.
8.- To recognize the importance of having a multidisciplinary team prepared and coordinated to deal with the serious side effects of immunotherapy.
9.- To understand the importance of the team's experience in order to effectively deal with the immunorelated secondary effects.
10.- To know the management of the different immuno-related toxicities and the importance of continuous re-evaluation.
11.-To know the different biomarkers used in clinical practice and the need for them to be available in order to prescribe the different immunological treatments.
12.- To know the lines of research on prognostic and predictive biomarkers of response to immunotherapy.
13.- To know how to plan a pilot study on potential biomarkers in immunotherapy.

3. Syllabus

There will be three main content blocks:

1.-Assessment of the response to immunotherapy: Radiological techniques commonly used (CT, MRI, PET) and new radiological techniques (IA, new isotopes), traditional radiological response criteria (RECIST 1.1) and specific ones (iRECIST), radiological manifestations of immunorelated effects, relationship between radiological response and survival (progression-free survival and overall survival).

2.- Prognostic and predictive biomarkers in immuno-oncology (IO). To know the main biomarkers related to response and toxicity in IO, both in blood and tissue.
* PD-L1: PD-L1 expression in tumour cells and tumour infiltrating inflammatory cells as a biomarker to predict response to immune checkpoint inhibitors, such as PD-1 and PD-L1 inhibitors. Patients with tumours showing high PD-L1 expression tend to have a higher likelihood of response to immunotherapy.
* TMB (Tumour Mutational Burden): TMB is a measure of the number of genetic mutations present in tumour DNA. Tumours

with a high TMB often have a higher neoantigen burden and therefore may be more susceptible to immunotherapy.
* MSI (Microsatellite Instability): Microsatellite instability is a condition in which the tumour DNA has alterations in the microsatellite regions. Tumours with high MSI tend to be more immunogenic and have a higher probability of response to immunotherapy.
* Tumour immunological profile: analysis of the immune cell infiltrate in the tumour, including the presence of activated T lymphocytes, natural killer (NK) cells and dendritic cells, can help predict the response to immunotherapy.
Genetic signatures and gene expression: evaluation of specific genetic signatures and expression of certain immune response-related genes, such as IFN-γ and granzyme B, can provide prognostic information about the response to immunotherapy.

3.- Evaluation and treatment of immunotherapy toxicity: evaluation and therapeutic strategy of the different immunorelated adverse events (irAEs) in the different organs and systems.

4. Academic activities

The subject has 6 credits (ECTS) equivalent to 60 hours. 80% are face-to-face (48 hours) and 20% are non-face-to-face (12 hours).

There will be three types of teaching activities:

A) Theoretical classes: lectures (Type 1A) participative (28 hours). One-hour lectures in which the necessary theoretical and general contents of the subject are presented in order to develop the competencies. It is in the general interest of the faculty to encourage participation.

B) Practical classes: solving problems, exercises and clinical cases (Type 2A) (32 hours). Presentation and discussion of practical cases related to the radiological evaluation of the response to immunotherapy, biomarkers of response and approach to the diagnosis, grading and treatment of the different types of immunorelated toxicity.

C) Tutorials. Tutorials: Students may request personal tutorials through the subject´s internal email. For this purpose, a convenient time slot will be agreed upon at the beginning of the term.

5. Assessment system

The final grade is the WEIGHTED AVERAGE of the grade obtained in each of the two sections that constitute the active participation in the lectures and the resolution of problems and cases. A minimum grade of 5 POINTS (out of 10) is required to pass.

A. Active participation in the lectures:
Attendance to the lectures is MANDATORY, and a minimum attendance of 80% is required.

It will have a weighting of 25% of the total final grade.

B. Solving of problems and cases: The student will have to solve questions related to the topics of the lectures as well as to the problems and cases developed in the problem and case sessions.

It will have a weighting of 75% of the total final grade.

6. Sustainable Development Goals

3 - Good Health & Well-Being
4 - Quality Education
9 - Industry, Innovation and Infrastructure