COMPARISON OF IMMUNE CHECK POINT INHIBITORS (NIVOLUMAB, PEMBROLIZUMAB, ATEZOLIZUMAB AND DURVALUMAB) IN THE TREATMENT OF NON-SMALL CELL LUNG CANCER: TOLERANCE AND FINANCIAL IMPACT

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Background

Immune checkpoint inhibitors upregulate anti-tumor activity by inhibiting the immune escape mechanism in tumor cells and immune cells. Therefore, targeting these immune checkpoints is expected to lead to enhanced anti-tumor responses in a large variety of tumors including non-small cell lung cancer. However, the setback on their use in practice is limited.

Objective

The aim of this work was to compare the real-world data of anti-PD-1 and anti-PD-L1 antibodies (nivolumab, pembrolizumab, atezolizumab, durvalumab) in terms of tolerance and financial impact in our hospital.

Material and methods

Inclusion criteria: non small cell lung cancer

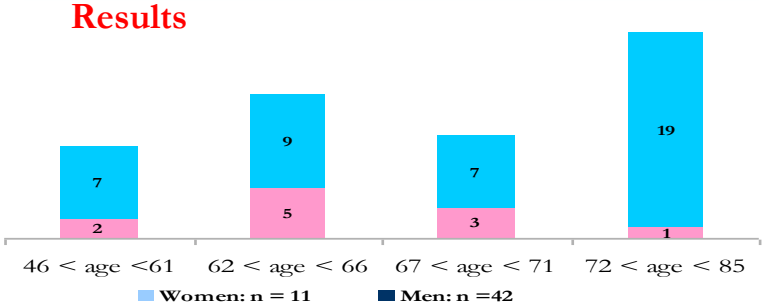
- Observational study while one year including patients treated in our hospital:
  - Durvalumab: 10 mg/kg every 2 weeks,
  - Nivolumab: 240 mg every 2 weeks,
  - Atezolizumab: 1200 mg every 3 weeks,
  - Pembrolizumab: 200 mg every 3 weeks.

=> Comparison criteria:

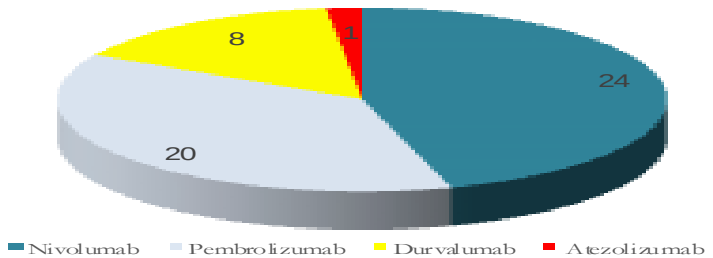
- Patient profile,
- Tolerance,
- Cost of treatment.

- Annual drug costs were calculated considering of VAT (2.1%). In the case of weight-dependent doses (durvalumab), the mean weight was of 80 kg (total doses per administration: 800 mg). The data were collected from computerized patient records (CliniCom® and Chimo®).

Results

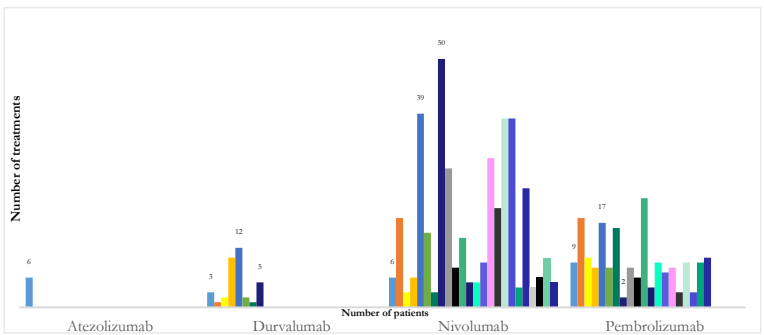


Picture 1: Patient profile



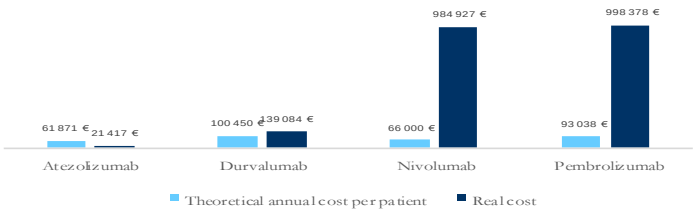
Picture 2: Immune check point inhibitors and the number of the patient

While the study period, we included 53 patients: nivolumab (n = 24), pembrolizumab (n = 20), durvalumab (n = 8) and atezolizumab (n = 1). The mean age was 67. 79% were men.



Picture 3: Number treatments per patient cycles

The number mean treatment cycles was: nivolumab (n = 16), pembrolizumab (n = 9.3), durvalumab (n = 4.5) and atézolizumab (n = 6).



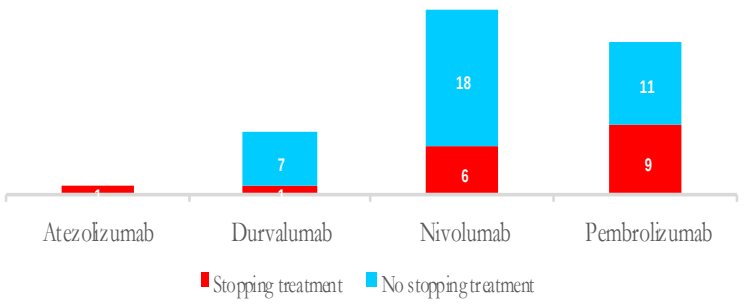
Picture 4: Treatments costs

Theoretical annual cost per patient per treatments are: € 61871 atezolizumab, € 66000 nivolumab, € 93038 pembrolizumab and € 100450 durvalumab. The real cost were € 21417 atezolizumab (for 6 treatments), € 984927 nivolumab (for 388 treatments), € 998378 pembrolizumab (for 186 treatments) and € 139084 durvalumab (for 36 treatments).

Table 1: Immune Check Point Inhibitors safety profiles

Side effects	Atezolizumab	Durvalumab	Nivolumab	Pembrolizumab
Diarrhea	-	-	2	3
Endocrine disorders	-	2	5	2
Haemoptysis ***		1		1
Hepatitis	-	-	1	1
Increased creatinine	-	-	1	-
Pneumonitis	-	1	9	1
Renal failure	-		1	-

*** Haemoptysis have caused hospitalization



Picture 5: Stopping treatments

64% of patients had side effects (79% nivolumab, 45% pembrolizumab, 50% durvalumab). Haemoptysis have caused hospitalization of 2 patients (pembrolizumab n = 1, durvalumab n = 1). The reasons for stopping treatment were: progression (9% nivolumab, 25% pembrolizumab, 100% atézolizumab) and side effects (14% nivolumab, 15% pembrolizumab, 12.5% durvalumab). The most common side effects were: pneumonitis (37% nivolumab, 5% pembrolizumab), endocrine disorders (25% durvalumab, 12.5% nivolumab and 5% pembrolizumab), diarrhea (15% pembrolizumab, 8% nivolumab).

Conclusion

Our study shows that the incidence of pneumonitis seems higher with nivolumab and that treatment interruptions appear more important with pembrolizumab. Nivolumab seems generally better tolerated than the other agents. Nevertheless for patients with baseline respiratory diseases, pembrolizumab could be considered as the preferred option. Clinicians should be aware of the risk of theses adverse events, as they may have a potentially negative impact on the patients' quality of life and survival outcome.

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