AN ASSESSMENT OF THE HOSPITALIZATION COSTS OF MELANOMA IN FRANCE IN THE ADVANCED/METASTATIC SETTING: THE MELISSA STUDY (MELANOMA IN HOSPITAL COSTS ASSESSMENT)

Economic evaluation is becoming increasingly important in the health technology appraisal of innovations in oncology, requiring accurate costing estimates. The objective of the MELISSA study was to estimate in France the mean cost per patient-year in pre- and post progression health states.

1. Data extraction


Data extraction:
- From the PMSI-MCO (French Medical Information System - Medicine, Surgery, Obstetric units) database during the study period, using the International Classification of Diseases, 10th revision (ICD-10 codes);
- Patient tracking in the PMSI SSR & PMSI HAD databases (post-acute care & hospitalizations at home: alternative management of care).

2. Patients and hospital stays selection

Incident adult patients hospitalized with the following criteria were included:
- Malignant melanomas of skin (ICD-10 code C33*) as PD/PJ/SAD (Principal Diagnosis / Related Diagnosis / Significantly Associated Diagnosis).
- Age at least and malignancy ICD-10 code C77 (Secondary and unspecified malignant neoplasm of lymph nodes) or C78 (Secondary malignant neoplasm of respiratory and digestive organs) or C79 (Secondary malignant neoplasm of other and unspecified sites) as PD/PJ/SAD.
- No chemotherapy session within 2 years prior to inclusion (naive patient).

The following stays or patients were excluded:
- Presence of another cause of primary tumor, since it was not possible to determine whether the metastasis was due to melanoma or to the other primary tumor, unless:
  - Ipilimumab was administered.
  - Fotemustine was administered in absence of malignant cerebral tumor (ICD-10 code C71).
- Hospital stays not related to melanoma, based on ICD-10 codes algorithm previously set up with experts.

3. Classification in progression health states

All selected stays were assigned into 2 sub-groups: either pre-progression or post-progression defined by the RECIST (Response Evaluation Criteria in Solid Tumors) criteria, which could be translated into MDS characteristics as follows:
- The occurrence of any new metastasis which was not present at inclusion
- Central metastases and palliative care always classified as post-progression state
- Any treatment change.

RESULTS

1. Characteristics of patients and stays

Among 78,750 stays which were identified with the combination of C3* AND (C77 or C78 or C79) ICD-10 codes within PMSI MCO in 2011, 2012 and 2013, 70% were directly related to melanoma and corresponding to 8,943 adult patients. 8,862 of them were classified as naive. Some of these 8,862 patients were also hospitalized in SSR and/or HAD after one of their MCO stays. The final selection was therefore 63,268 stays in 8,862 incident patients.

2. Mean cost per patient-year (using adjusted-ENCC)

Estimate of mean cost per patient-year of hospitalizations for metastatic melanoma patients. In the pre-progression state 4,973 and €3210 in the post-progression state (Fig. 3).

3. Hospitalsizations with chemotherapies/immunotherapies:

3 types of valuations
- The mean cost per administration of ipilimumab, of fotemustine and of chemotherapy/immunotherapy was estimated according to the 3 types of valuations (ENCC, Adjusted-ENCC and TJA).
- For ipilimumab, the mean total cost (drug + stay associated to its administration) was less than €1,000 with ENCC, whereas it reached €16,000 with adjusted-ENCC and TJA valuations.
- Similarly, costs were higher in the post-progression state for clinical/immunotherapies/immunotherapies and for transportation.

4. Valuation

4.1. Mean cost per patient year per progression health state

The mean annual cost per patient per progression health state was estimated according to 2 assumptions:
- 100% of patients used reimbursed transportation to come to and leave hospital.

5. Calculation of duration in each progression health states

Duration in each progression state was estimated according to the duration of the follow-up period.

CONCLUSION

The MELISSA study is the first estimation of hospital costs specifically associated with advanced melanoma in France in the new era of BRAF targeted treatments.

The transportation distribution was based on the general population; ENCC costs cannot be estimated.

Costs included:
- Costs of hospital stays
- Costs attributed to the administration of drugs
- Costs attributed to the transportation of the patient
- Costs of clinical/immunotherapies/immunotherapies
- Costs of chemotherapies
- Costs of palliative care
- Costs of death.

The PMRI represents a comprehensive collection of all inpatient stays in France in an identical demographic setting in pre and post progression health states (adjusted-ENCC).

6. Mean cost per administration of ipilimumab, of fotemustine, of chemotherapy/immunotherapies, of palliative care, of chemotherapies, of hospitalizations and of death.

For a drug covered by the DRG, this mean cost per administration was:
- €998 for ipilimumab
- €874 for fotemustine
- €557 for chemotherapy
- €3210 for hospitalization
- €19,894 for death.

The mean cost of administration of fotemustine was around €900 (drug + administration) whereas it reached €557 for ipilimumab and €504 for fotemustine.

The transportation distribution was based on the general population.