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Extra-cost of brain metastases in patients with non-squamous non-small cell lung cancer (NSCLC)

A French national hospital database analysis

Objective

To assess the incremental cost associated with the management of brain metastases (BM) at the time of diagnosis, among patients with primary non-squamous non-small cell lung cancer (NSCLC).

Methods

Data extraction

STUDY PERIOD:
January 1st, 2013 to December 31st, 2015.

DESIGN:
Retrospective study of the PMSI-MCO (Medicine, Surgery, Obstetrics) database, a comprehensive collection of all inpatient stays in France and using International Classification of Diseases, 10th Revision (ICD-10) codes.

DATA EXTRACTION:
All 2013 hospital stays with ICD-10 codes for lung cancer (C34*) combined with at least one metastasis code (C77*, C78*, C79*) but without any other primary cancer were extracted.

Study population

Incident patients with metastatic lung cancer, with or without brain metastasis at diagnosis, were included (no primary or metastatic cancer, including lung cancer, during the 12-month retrospective period).

In the group of **patients without brain metastasis at diagnosis,** patients with any sign of brain metastasis during the 12-month retrospective or the 24-month prospective periods were excluded.

Patients with at least one prescription of bevacizumab or pemetrexed at the index hospitalisation or during the 24-month prospective following period were considered to have **non-squamous NSCLC** and were included.

Identification of 2 cohorts

- Metastatic NSCLC patients WITHOUT brain metastasis (metastases at other sites)
- Metastatic NSCLC patients WITH brain metastases

Follow-up of patients

Patients of each cohort were followed during the 24-month prospective period from the index hospitalisation. All stays with C34* code as main diagnosis (MD) were automatically retained, as well as stays where the MD code was considered to be related to lung cancer or its metastases (e.g. 'anaemia in chronic diseases classified elsewhere' (D63*), 'other aplastic anaemias' (D61*), 'pleural effusion in conditions classified elsewhere' (J61*)). Stays with other codes for cancer documented as the MD were eligible if a C34* code was documented as an associated diagnosis or if no other primary cancer was documented.

Economic evaluation

For each patient, total in-hospital medical resource consumption associated with the initial hospitalisation in 2013 and with any follow-up stays in the following 24 months was documented. Costs were attributed from official French national tariffs and expressed in 2017 Euros.

Conclusion

The presence of brain metastases at the time of diagnosis of non-squamous NSCLC carries a significant burden, and ways of lowering this burden are needed.

Results

Study population

	WITHOUT BRAIN METASTASIS	WITH BRAIN METASTASES
	1,529 patients	971 patients
Gender	1,055 men (69%) / 474 women (31%)	576 men (59%) / 395 women (41%)
Mean age at inclusion	62.6 years (± 9.8 years)	58.6 years (± 9.1 years)
Mean duration of follow-up	435 days (± 272 days)	415 days (± 250 days)
Hospitalisations in the 24-month follow-up period	25,244 hospitalisations, Rate: 17	19,997 hospitalisations, Rate: 21
Deceased patients	942 patients (62%)	695 patients (72%)

Cost analysis

	WITHOUT BRAIN METASTASIS	All	WITH BRAIN METASTASES
	1,529 patients		971 patients
Cost per patient-month*	€2,426	+€553 (+23%)	€2,979
Radiotherapy	(13%) 197 patients		560 patients (58%)
Cost per patient-month*	€52	+€164 (+315%)	€216
Palliative care	(23%) 359 patients		361 patients (37%)
Cost per patient-month*	€158	+€130 (+82%)	€288
Chemotherapy	(>99%) 1,522 patients		970 patients (>99%)
Cost per patient-month*	€1,301	+€27 (+2%)	€1,329
Other management**	(97%) 1,480 patients		957 patients (99%)
Cost per patient-month*	€915	+€232 (+25%)	€1,147

** The cost per patient-month of management "X" is calculated for all patients, whether or not they have a stay corresponding to management "X".*
*** Other management were surgical, medical, interventional…*