

Immunotherapy with pembrolizumab deemed cost-effective for advanced melanoma in Hong Kong

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Immunotherapy with pembrolizumab has been deemed a cost-effective first line treatment for advanced melanoma patients in Hong Kong, researchers report at the ESMO Asia 2016 Congress in Singapore.

"This is the first study to address the cost-effectiveness of checkpoint inhibitors in the management of advanced cancer in Hong Kong," said lead author Dr Herbert Loong, Clinical Assistant Professor in the Department of Clinical Oncology of The Chinese University of Hong Kong. "We have determined that whilst pembrolizumab is expensive, the increase in quality adjusted life years (QALYs) compared with standard cytotoxic chemotherapy, and even more so with ipilimumab, qualifies it as a cost-effective approach."

Advanced melanoma historically had a dismal prognosis but checkpoint inhibitors - the anti-CTLA4 antibody ipilimumab and more recently the anti-PD1 antibodies nivolumab and pembrolizumab - have dramatically improved disease control. Pembrolizumab has been shown to improve overall survival and progression-free survival compared to ipilimumab. However, Dr Loong said: "The high costs of these drugs may be prohibitive to the average patient who has to pay out-of-pocket, and may place significant burdens on healthcare systems. There is a need to rationally assess cost-effectiveness by addressing the potential benefits to patients and society balanced against price."

Assessment of cost-effectiveness of treatments is extremely important in Hong Kong, where it has direct implications on drug reimbursement and availability at public hospitals. This study evaluated the cost-effectiveness of pembrolizumab used in the first line setting in patients with advanced melanoma in Hong Kong, and compared it to ipilimumab and cytotoxic chemotherapy.

Ipilimumab is registered for this indication in Hong Kong but is not reimbursed by the Hospital Authority and patients have to pay out-of-pocket. The cost and side effects of ipilimumab have prohibited its use for most advanced melanoma patients in the public setting. The cytotoxic chemotherapies chosen for comparison were drugs commonly used in the first line setting in Hong Kong, and included dacarbazine, temozolomide and the combination of carboplatin plus paclitaxel.

The researchers collected the following information about each drug: efficacy (extrapolated from landmark clinical trials), cost (in the public setting), incidence of adverse events (from clinical trials), cost of drug administration and management of adverse events (calculated based on treatments/investigations/management an adverse event may entail, with cost of each component obtained from the HK Government Gazette and the Hong Kong Hospital Authority).

Biostatistical modelling was performed based on a three stage partitioned survival model. This means that the researchers determined a fixed cost per unit time for patients at each of the following stages of their disease journey: progression-free state, disease progression state, death.

They determined the life-years gained, the QALYs, the total cost (including drug administration cost, disease management cost, death related cost and adverse event cost), and the incremental cost effectiveness ratio (ICER) between the comparative treatments.

The researchers found that, based on the World Health Organization's (WHO) threshold of a new treatment being cost effective, if the ICER is less than three times the national gross domestic product (GDP) (Hong Kong: 3xGDP = US Dollars [USD] 119,274), pembrolizumab is cost-effective relative to both ipilimumab and also cytotoxic chemotherapy when used in the first line setting. The ICER of pembrolizumab versus ipilimumab was USD 8,034/QALY and of pembrolizumab versus [cytotoxic chemotherapy](#) (using dacarbazine as representation) was USD 53,123/QALY.

Dr Loong said: "We hope the healthcare authorities in Hong Kong will use this information to consider including pembrolizumab as a reimbursable item in the first line setting of advanced melanoma. This will help ensure patients' access to an effective treatment."

Commenting on the findings, Dr Mark Tang, senior consultant dermatologist, The Skin Specialists and Laser Clinic, Singapore, said: "Given the high [costs](#) of these new treatment options, cost effectiveness studies such as this one are timely and useful as further evidence for the use of pembrolizumab in the treatment of advanced melanoma. This is particularly important in an Asian context where, although rare, acral melanoma has unfortunately been known to present late advanced disease."

He continued: "This was a model based study using results from the KEYNOTE-006 trial, which may not be entirely generalisable to Asian patients due to underlying clinical and genetic differences in melanoma between races and possible variations in outcomes. This cost analysis was based on data from Hong Kong and therefore further prospective efficacy and health economic studies in Asian patients in different countries will be useful to guide and inform clinicians."

Provided by European Society for Medical Oncology

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