Prevalence of Prostate Cancer Clinical States in US: Estimates Using a Dynamic Progression Model

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INTRODUCTION

Prostate cancer is the second leading cause of mortality and morbidity in the US, with an age-adjusted incidence rate of 242.4 cases per 100,000 persons per year. The estimated incidence was 220,570 in 2011 (12% increase from 2000).23 Despite the high overall incidence of prostate cancer, most newly diagnosed patients are in the 65-years and older age group, with a median age at diagnosis of 67 years.24 About 1 in 3 men will develop prostate cancer over their lifetime.25

In the US, prostate cancer is a major cause of morbidity and mortality among older men.26 The American Cancer Society estimates that 238,390 new cases and 32,290 deaths will occur in 2011.1

CONCLUSIONS

This model suggests that each year a substantial number of prostate cancer patients in the US progress to advanced metastatic disease. These patients can suffer from significant morbidity and have a high risk of mortality. For these men, new, more effective systemic therapies are needed to improve outcomes.

METHODS

This model uses a dynamic progression model that simulates the progression of prostate cancer patients through a series of 8 Markov states, which are defined in Table 1. Each of these states is defined by the status of the primary tumor, the presence of metastatic disease, and the presence of high-risk features. The model also uses data for the all-cause mortality (Table 1) associated with each metastatic state.

The model, as described above, was custom programmed in the Java™ programming language.

RESULTS

Failure rates for each state are estimated using previously published Kaplan-Meier progression survival and overall survival curves specific to each clinical state (Table 1).5-18 Trials reported after December 2009 are not included in Table 1.

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