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Patterns of care and survival after a cancer of unknown primary (CUP) diagnosis: A population-based nested cohort study in Australian Government Department of Veterans' Affairs clients☆

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ABSTRACT

Background: Little is known about patterns of care after a cancer of unknown primary (CUP) diagnosis.
Methods: We performed a retrospective cohort study to describe and compare the treatment, health service use and survival of patients with CUP and metastatic cancer of known primary among 143,956 Australian Government Department of Veterans' Affairs clients, 2004–2007. We randomly matched clients with CUP (C809; $n = 252$) with clients with a first diagnosis of metastatic solid cancer of known primary ($n = 980$). We ascertained health services from the month of diagnosis up to 2 months post-diagnosis for consultations, hospitalizations and emergency department visits, and up to 1 year for treatment. We compared cancer treatments using conditional logistic regression; consultation rates using negative binomial regression; and survival using stratified Cox regression.
Results: 30% of CUP patients and 70% of patients with known primary received cancer treatment and the median survival was 37 days and 310 days respectively. CUP patients received fewer cancer medicines (odds ratio (OR) = 0.54, 95% confidence interval (CI) 0.33–0.89) and less cancer-related surgery (OR = 0.25, 95% CI 0.15–0.41); males with CUP received more radiation therapy (OR = 2.88, 95% CI 1.69–4.91). CUP patients had more primary care consultations (incidence rate ratio (IRR) = 1.25, 95% CI 1.11–1.41), emergency department visits (IRR = 1.86, 95% CI 1.50–2.31) and hospitalizations (IRR = 1.18, 95% CI 1.03–1.35), and a higher risk of death within 30 days (hazard ratio = 3.30, 95% CI 1.69–6.44).
Conclusions: Patients with CUP receive less treatment but use more health services, which may reflect underlying patient and disease characteristics.

1. Introduction

Cancer of unknown primary (CUP) is a diagnosis given to patients who present with metastatic cancer and no identifiable primary site. CUP is a heterogeneous collection of tumors, most displaying aggressive behavior, poor treatment response,[1] and poor survival.[2,3] Worldwide, CUP accounts for 3–5% of all incident cancers.[4]

Despite guidelines for the management of patients with CUP[5,6] we know little about the real world patterns of care. There are few international[7–10] and no Australian population-based data on the actual treatment that patients receive after diagnosis. Furthermore, there have been no investigations of whole-of-healthcare. Evidence to-date suggests that a minority of CUP patients receive active cancer treatment. In a population-based Netherlands study of 1024 CUP patients, only 29% received cancer treatment.[7] In a Canadian study of 389 CUP patients, cancer treatment rates ranged from 37% among those aged <65 years to 23% of those aged >75 years.[8] Routinely linked administrative data allows for the identification of all health service utilization. Understanding the treatments CUP patients receive and how they interact with the health system will inform future patient management.

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In a cohort of Australian veterans we aimed to describe and compare the treatment patterns, health service use, and survival of patients diagnosed with CUP and with metastatic cancer of known primary.

2. Materials and methods

2.1. Setting

Australia's publicly funded universal health care system entitles all citizens and permanent residents to a range of health services including: treatment in public hospitals; subsidized treatment in private hospitals; subsidized outpatient services including consultations with clinicians; and subsidized access to medicines prescribed in private hospitals and the community.

2.2. Study population

We performed a retrospective cohort study among members of the Australian Government Department of Veterans' Affairs (DVA), 52% of whom are male.[11] DVA clients receive the same health care services as the Australian general population, plus subsidized care under DVA arrangements with no or minimal co-payment depending on their level of entitlement. This is an elderly cohort (68% aged $\geq$80 years),[11] corresponding to the age group at greatest risk of a CUP diagnosis in NSW.[3] The DVA population is ideal to address our research question as the majority of DVA clients receive fully subsidized health care. Thus, there is almost complete ascertainment of their health care utilization, at both public and private facilities, information that is not available for the general Australian population.

The NSW Central Cancer Registry records all cancers diagnosed in NSW residents, other than squamous and basal cell carcinoma of the skin. All DVA clients residing in NSW and registered with CUP (ICD-O-3 C80.9) between July 1, 2004 and December 31, 2007 after an audit[12] were eligible for inclusion ($n = 393$). We excluded patients (Fig. 1) if: they did not receive subsidized health care from the DVA during the study period ($n = 66$); they did not have at least three months of linked administrative data prior to diagnosis ($n = 31$); their DVA record did not link to any of the administrative databases used in this study ($n = 8$); their date of birth and/or sex did not match between databases ($n = 3$); we could identify no matched controls ($n = 1$); they were registered as death certificate only cases ($n = 29$); they were not NSW residents for the duration of the study ($n = 3$).

We randomly selected a comparison cohort from all clients registered with a diagnosis of metastatic solid cancer of known primary (ICD-O-3 C00-C97 excluding those with hematological morphology) with regional or distant spread at diagnosis. Clients were matched on month and year of diagnosis, level of DVA health care subsidy, and duration of follow-up prior to diagnosis. We did not match on age and sex as we wished to examine the effect of these factors. We selected up to four people with known primary for each CUP patient using incidence density sampling with replacement.[13] A risk set was defined as each CUP patient and the matched individuals with known primary.

2.3. Data sources

We obtained patient demographics, state of residence and date of death from the DVA, and the month and year of cancer diagnosis, basis of diagnosis, degree of spread (highest stage reported to the registry within four months from diagnosis), tumor morphology and cause of death (cancer or non-cancer) from the cancer registry.

We identified cancer treatment and health service utilization from four sources of routinely collected population-based administrative data. The Pharmaceutical Benefits Scheme is a national program subsidizing prescription medicines, while the Repatriation Pharmaceutical Benefits Scheme subsidizes additional items for DVA clients, and contains records of all items dispensed in the community or in a private hospital.

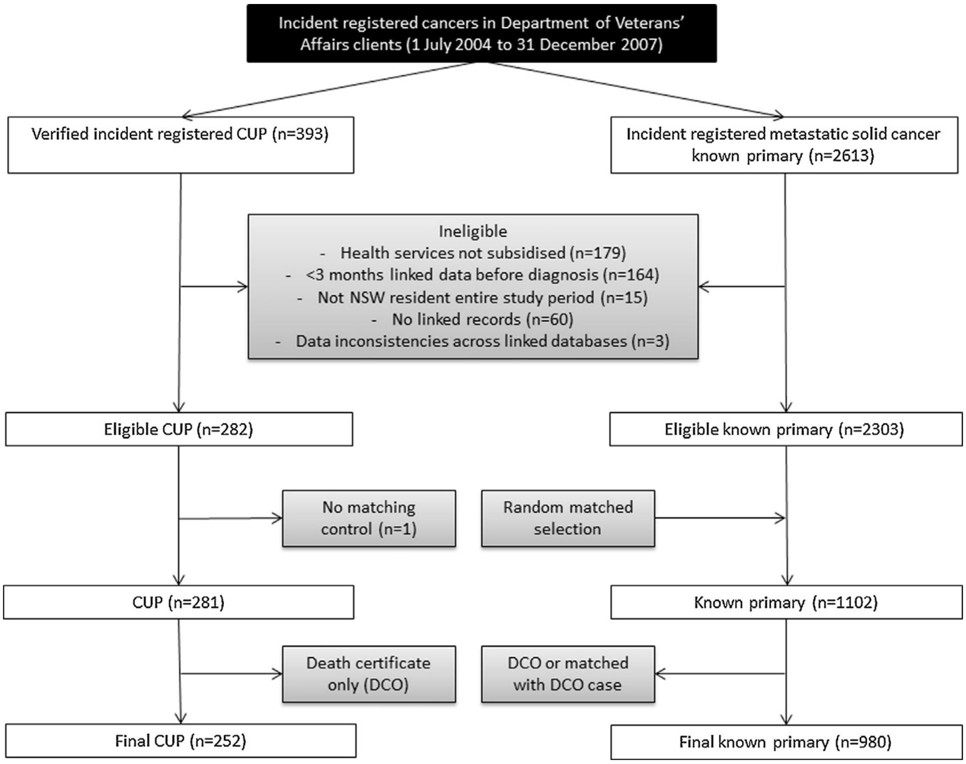

Fig. 1. CONSORT diagram showing the flow of potential participants.