Short-term ovarian cancer mortality in England – Investigating the causes

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INTRODUCTION

Ovarian cancer survival in England lags behind other European countries [1]. The International Cancer Benchmarking Partnership (ICBP) showed that England had considerably worse one-year survival rates than comparable countries around the world [2], but the difference in five-year survival rates was smaller. Furthermore, five-year survival rates among patients who survived at least one year from diagnosis were as high in England as in any of the ICBP countries.

A common explanation for poor one-year survival in the UK is later diagnosis than other countries. However, further work by the ICBP showed that the UK had a relatively favourable stage distribution for ovarian cancer, which is not consistent with more delayed diagnoses than other countries [3].

This analysis investigates possible causes for higher short-term mortality rates in England. The results presented here are those from preliminary, descriptive analyses intended to advise the direction of future work. The work was intended to answer two questions:

1. Is there a period of particularly high mortality?
2. Are there factors which appear to predict high mortality rates?

METHODS

Data on ovarian cancer (ICD10 C56 & C57) patients diagnosed in England between 2006 and 2008 were extracted from the National Cancer Data Repository, with linked data extracted from Hospital Episode Statistics data and the Routes to Diagnosis dataset. Cases identified only from a death certificate were not included.

In total, 16,943 women diagnosed with ovarian cancer in 2006-2008 were included in the analysis.

Analysis considered cumulative mortality rates in the first year after diagnosis, and summarised differences according to:

- Age at diagnosis
- Comorbidity (Charlson score)
- Deprivation quintile
- Route to diagnosis
- Tumour stage
- Morphology (tumour type)

Some consideration was given to the combined effect of multiple factors. More in depth case-mix analysis is ongoing.

RESULTS

Mortality was very high in the first two months after diagnosis (Figure 1). Of the 5,288 women who died in the first year after their ovarian cancer diagnosis, 2,592 (49%) died in the first two months (60 days).

There were substantial differences in mortality by age at diagnosis. Only 226 (7%) of the 3,093 women diagnosed under age 50 died in the first year, compared with 1,604 (43%) of the 3,773 women diagnosed aged between 70 and 79 and 1,946 (70%) of the 2,762 women diagnosed aged 80 or older.

Women with recorded comorbidities had higher mortality than those without, with increased mortality among those with multiple or serious comorbidities.

There was no substantial variation between deprivation quintiles.

There were large differences in mortality by route to diagnosis, with 2,827 (56%) of the 5,042 women diagnosed via an emergency presentation route* dying in the first year, compared with 700 (19%) of the 3,778 women diagnosed after a two week wait referral for suspected cancer.

There were significant differences in mortality by tumour stage. However, most women with known tumour stage had advanced stage disease and the vast majority of women who survived less than one year from diagnosis did not have a recorded stage. Of the 5,288 women who died in the first year after diagnosis, 1,371 (26%) had advanced stage disease and 3,767 (71%) did not have a recorded stage.

Tumour morphology also appeared to be a major risk factor. Women with non-specific morphologies had high mortality. Of the 5,023 women with 'unclassified epithelial†' morphology, 3,028 (60%) died in the first year. Of the 845 women with 'miscellaneous‡ and unspecified§' morphology, 599 (71%) died in the first year.

Advanced age (*age*), emergency presentation (*emergency*) and non-specific tumour morphology (*morph*) were the main risk factors for mortality in the first year, and also in the first two months after diagnosis (Figure 2).

To consider how much these risk factors relate to each other, mortality by each combination of risk factors was investigated. The number of risk factors was associated with substantially higher mortality in the first year after diagnosis (Figure 2). Almost 86% of the 1,908 women with all three main risk factors died in the first year after diagnosis, compared with just over 7% of the 6,573 women without any of the risk factors.

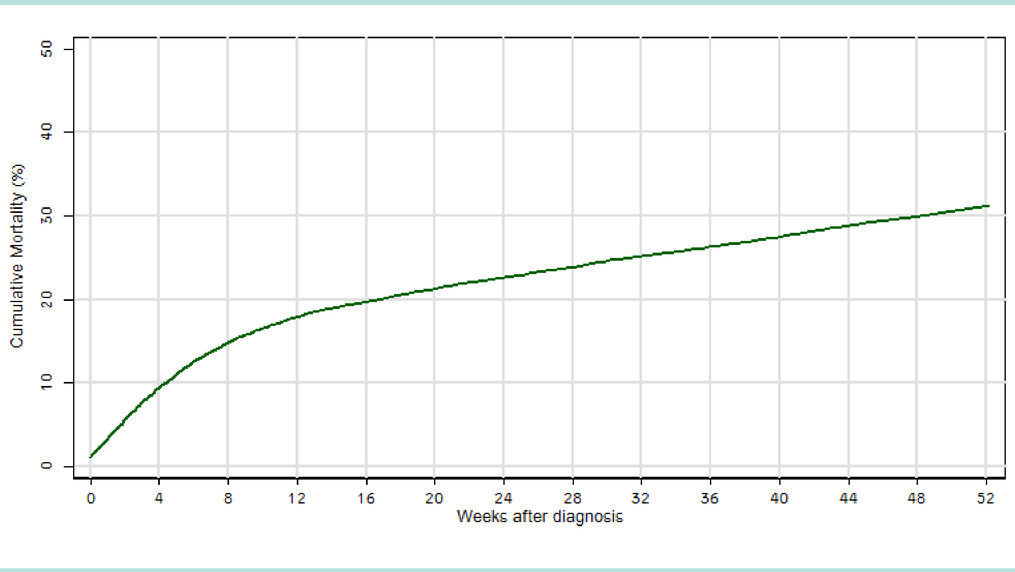

Figure 1. Cumulative mortality among women with ovarian cancer in the first year after diagnosis, England 2006-2008.

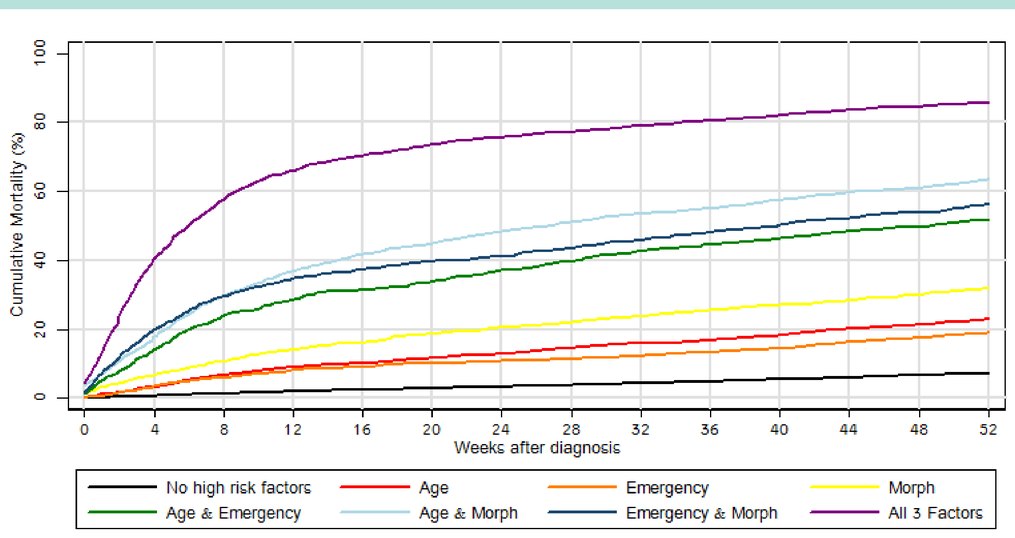

Figure 2. Cumulative mortality among women with ovarian cancer in the first year after diagnosis by combinations of main risk factors, England 2006-2008.

* - including both A&E attendances and emergency GP referrals.
† - not classified according to World Health Organisation classification for specific anatomical site.
‡ - other miscellaneous tumour types including sarcomas.
§ - malignant but unknown histogenesis.

DISCUSSION

The high risk tumour morphologies are unlikely to represent high risk forms of the disease. Most of the morphologies grouped into 'unclassified epithelial' or 'miscellaneous and unspecified' may be assigned when a woman did not receive the investigations required to accurately assign a morphology to her tumour. It seems likely that these non-specific morphologies are associated with women who were extremely ill at diagnosis, for whom full investigation may not be clinically appropriate.

Stage is unlikely to be a major risk factor for short-term mortality as the majority of ovarian cancer patients are diagnosed with stage 3 or 4 disease [3]. Furthermore, patients who die shortly after diagnosis are unlikely to be fully staged, as staging investigations may not have been clinically appropriate or there may not have been time for investigations to be carried out.

The route to diagnosis is clearly a very important factor in patients' short-term prognosis. However, emergency presentation is certainly associated with other factors, such as poor performance status, which means that reducing the proportion of patients diagnosed via an emergency presentation route is unlikely to be a panacea for improving short-term ovarian cancer mortality.

CONCLUSIONS

- Mortality among women with ovarian cancer is extremely high in the first couple of months after diagnosis.
- There are two clear main risk factors for dying in the first year after diagnosis, namely:
  - Advanced age at diagnosis (70+ years).
  - Diagnosis via an emergency presentation route.
- Non-specific tumour morphology appears to be a main risk factor for short-term ovarian mortality, but is likely to be assigned when a patient is not suitable for surgical investigation, perhaps due to ill health.
- Women with multiple risk factors have considerably higher mortality. Over the first year as a whole, those with all three risk factors have a mortality rate twelve times higher than those with one risk factor.
- The main three risk factors identified here may well be associated with several other factors which affect mortality, such as patient co-morbidity, performance status, or treatment.
- Work is ongoing to account for the case-mix effect of potential risk factors, including treatment, as well as to identify and explain possible regional variations.

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