



The development of an algorithm to identify breast cancer recurrences

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NCIN Cancer Outcomes Conference , Brighton, June 2013

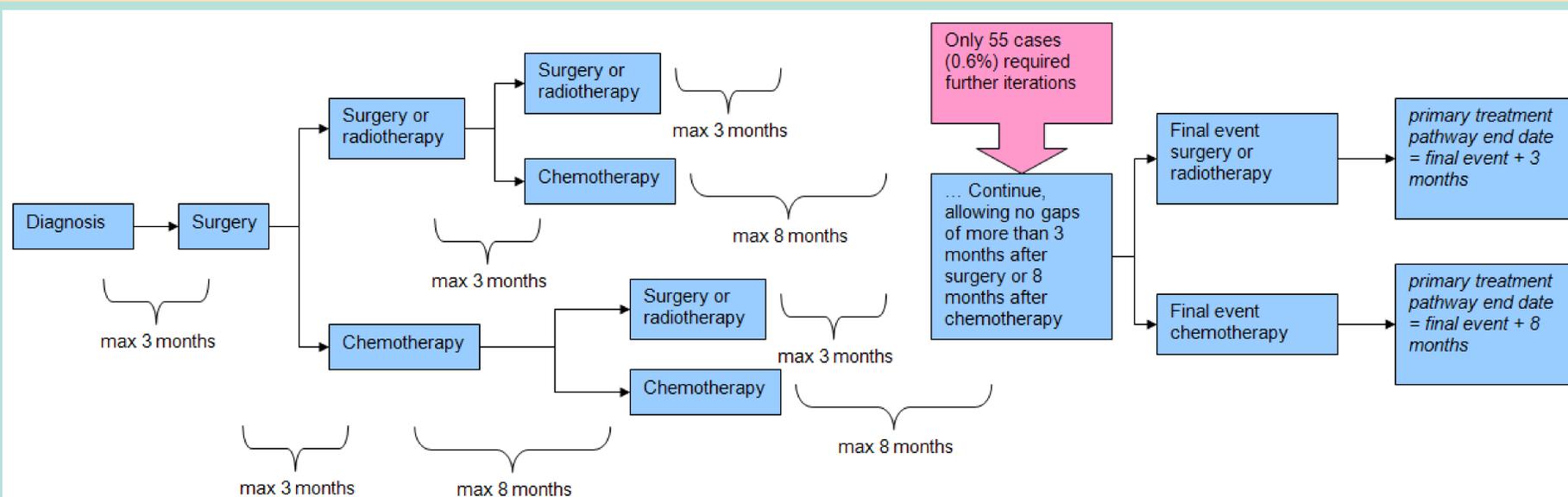
BACKGROUND

The West Midlands cancer registration database records treatment events for the whole breast cancer pathway. Coding staff use treatment event dates and patterns to identify and flag recurrences. An algorithm developed to determine whether a treatment event lies within the initial treatment phase of a breast cancer was used to verify the flags for recurrence and/or progressive disease added by coding staff.

METHOD

Cases in the dataset had at least one surgical event (not necessarily to the primary tumour). Cases with incomplete dates were excluded (3%). Patients with radiotherapy or chemotherapy before their first surgery or more than three months from diagnosis to first surgery were excluded (5%). 9,540 invasive breast cancers diagnosed in 2003-05 in the West Midlands had their primary treatment pathway determined by the algorithm.

RESULTS



Defining the primary treatment pathway

The primary treatment pathway for breast cancer may have a long duration, making it difficult to differentiate between recurrence and progression of disease. To define the primary treatment pathway only surgery, radiotherapy and chemotherapy events were considered. Previous analysis of West Midlands cancer registration data showed that treatment events up to 3 months after surgery or radiotherapy and up to 8 months after chemotherapy related to the same treatment episode.

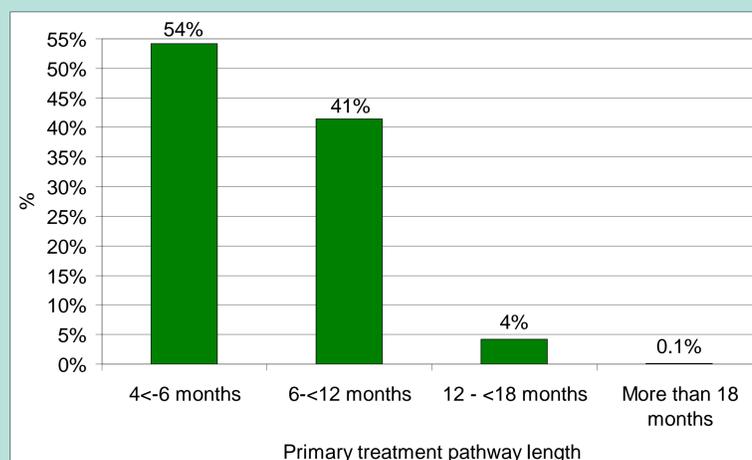
Developing a recurrence algorithm

Once the pathway length had been calculated, the timing of other diagnosis and treatment events was examined.

- Diagnosis or treatment events recorded during the primary treatment pathway are either progression of disease or metastases diagnosed during primary treatment.
- Diagnosis or treatment events recorded in the year after the primary treatment pathway are hard to classify and may indicate progression of disease or metastases diagnosed during primary treatment or recurrence. (907 (10%) of the 9,540 cases had further diagnosis/treatment in the year after the initial treatment phase.)
- If there is a gap of a year or more after the primary treatment pathway, the case has a well defined primary treatment pathway. (8,633 cases (90%) had a defined treatment pathway.)

Primary treatment pathway length

9,540 invasive breast cancers diagnosed in 2003-05 in the West Midlands had their primary treatment pathway determined by the algorithm. Of these, 96% had a primary treatment pathway length of less than 12 months.



Recurrence rate

For cases with a defined treatment pathway, diagnosis or treatment events recorded after a 12 month gap may indicate recurrence.

Of the 8,633 cases with a defined treatment pathway, 827 had further diagnosis/treatment events after a gap of at least 12 months from the end of the defined treatment pathway. The overall recurrence rate in the dataset was 10% [827/8,633].

CONCLUSION

The algorithm successfully distinguished between recurrences and progressive disease. The recurrences recorded on the cancer registration database, their timing and nature will now be validated using external clinical input and external clinical databases.