Towards personalized breast cancer follow-up: prediction model for recurrence and allocation of visits during 10 years of follow-up

A. Witteveen1,2, J.W. Ruiter1, R. Bretveld1, C.G.M. Groothuis-Oudshoorn1, I.M.H. Vliegen1, M.J. IJzerman1, S. Siesling1,3

1 Dept. of Health Technology and Services Research (HTSR), MIRA institute for Biomedical Technology and Technical Medicine, University of Twente, Enschede, the Netherlands; 2 Robert D. and Patricia E. Kern Center for the Science of Health Care Delivery, Mayo Clinic, Rochester, MN, USA; 3 Dept. Research, Netherlands Comprehensive Cancer Organisation (IKNL), Utrecht, the Netherlands

This model can be used to identify patients with a low or high risk to personalize follow-up after breast cancer, develop a decision support tool and allocate resources efficiently over the whole follow-up period.

More information:
Annemieke Witteveen, MSc
PhD candidate
www.utwente.nl/influence
A.Witteveen@utwente.nl

BACKGROUND
Aim: to analyze recurrence patterns and define predictive factors for locoregional recurrence (LRR) and subsequent recurrences up to 10 years after the primary tumor.

Follow-up in the Netherlands from 2012:
- Year 1: Mammography and physical examination

Using risk thresholds, follow-up visits can be reallocated based on risk over the ten years following primary treatment.

PATIENTS & METHODS
Netherlands Cancer Registry (NCR):
- Women diagnosed in 2003 with primary invasive breast cancer
- No distant metastasis (DM), synchronous or previous tumors
- Curatively treated in NL -> N=8,035

Survival analysis: Predictors first, second and third recurrence
Based on current follow-up: Determination lower risk threshold and quantiles for intervals.

RESULTS

1st event 5.7% 6.4%
2nd event 25.3% 18.4%
3rd event 56.4% 37.8%

SP LRR No recurrence DM

Most important predictors for all types (LRR/second primary/DM) of second recurrence were tumor size, surgery type and radiotherapy, with the effect of the last two reversed compared to the first recurrence.

As an example, three risks groups were made for low (>50, hormone therapy), medium (<50, hormone therapy) and high (>50, no hormone therapy) risk.

Intervals and threshold based on 5 visits in 5 year:

Hazard of complete population after 5 year: 0.0068

Lower risk threshold

Below this hazard, we ‘accept’ the risk.

CONCLUSIONS

Given these thresholds, the medium risk group should receive 2 follow-up visits, and the high 7 during the period of ten years. The low risk group remained below the threshold for all the ten years.

www.utwente.nl/influence