PROGNOSTIC VALUE OF GERIATRIC SCREENING AND ASSESSMENT FOR OVERALL SURVIVAL IN OLDER PATIENTS WITH CANCER

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Presenting on behalf of…

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1. Aim of the study

To determine the *prognostic value* of geriatric screening and geriatric assessment (GA) components and of *different models of assessment* for *overall survival* (OS) in older patients with cancer.
2. Patient and methods (1)

- Prospective, multicentric, cohort study

- Inclusion criteria:
  - age 70 years or older
  - 6 tumor types:
    - breast, colorectal, lung, ovarian, prostate, hematologic malignancies
  - treatment decision had to be made

- Data presented: patients with carcinoma
2. Patient and methods

- **Geriatric screening:**
  1. G8,
  2. Flemish version of the Triage Risk Screening Tool (fTRST).

- **Geriatric assessment (GA) components**: 
  1. Living situation,
  2. Activities of Daily Living [ADL],
  3. Instrumental Activities of Daily Living [IADL],
  4. Fall history in the past 12 months,
  5. Fatigue (Mobility – Tiredness Test [MOB-T]),
  6. Cognition (Mini Mental State Examination [MMSE]),
  7. Depression (Geriatric Depression Scale [GDS]),
  8. Nutrition (Mini Nutritional Assessment – Short Form [MNA-SF]),
  9. Comorbidities (Charlson Comorbidity Index [CCI]),

2. Patient and methods (3)

- **GA models:**
  - All GA components (10)
  - G8
  - fTRST
  - ECOG-PS
  - ‘Gold standard’:
    - presence of at least two of the following 7 items: 1/ living alone; 2/ ADL score > 6; 3/ IADL score < 5(male)/8(female); 4/ MMSE score < 24; 5/ GDS-15 score ≥ 5; 6/ MNA score < 24 and 7/ presence of at least one comorbidity on the CCI

- **Covariates:** age, carcinoma type, stage

- **Outcome variable:** OS
2. Patient and methods

- **Statistical analysis:**
  - Kaplan-Meier analyses with log-rank test to explore the impact on OS.
  - Cox regressions with the covariates (age, carcinoma type, stage) +
    - geriatric screening tools, GA components, ECOG-PS and ‘gold standard’, either dichotomous or continuous followed by comparison of AIC values
    - different GA models
  - Concordance Probability Estimate (CPE) values and pseudo R-square values were calculated to evaluate the discriminatory power of the different GA models.
    - CPE value: value between 0.5 and 1
      (0.5 = no discriminatory power, 1 = full discriminatory power).
    - R-square value: value between 0 and 1
      (*100 = percentage of variance of OS explained by the GA model).
3. Results

788 patients included (October 2009 to July 2011)

<table>
<thead>
<tr>
<th>Age</th>
<th>Median age: 76 years (range: 70-95)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>Female</td>
</tr>
<tr>
<td></td>
<td>526 (66.8)</td>
</tr>
<tr>
<td>Diagnosis</td>
<td>Breast cancer</td>
</tr>
<tr>
<td></td>
<td>379 (48.1)</td>
</tr>
<tr>
<td>Stage</td>
<td>Stage I</td>
</tr>
<tr>
<td></td>
<td>91 (11.5)</td>
</tr>
</tbody>
</table>
3. Results (2)

- Median time of follow-up: **28.7 months**
  - range: 0.02 – 52.3 months
  - 425 deaths (53.9%) during the follow-up period

- Median survival time: **33.0 months**
3. Results (3)

- Overview of the Kaplan-Meier plots of the individual geriatric screening and GA components.
  - Dichotomous
  - Based on predefined cut-off scores

- Overview of the AIC values

- Overview of the CPE values and pseudo R-square values for comparison of the different GA models.
3. Results: Kaplan-Meier plot

Screening tool: G8

Screening tool: fTRST
3. Results: Kaplan-Meier plot (5)

1. Living situation

2. ADL
3. Results: Kaplan-Meier plot (6)

3. IADL

4. Falls
3. Results: Kaplan-Meier plot

5. MOB-T

6. MMSE
3. Results: Kaplan-Meier plot (8)

7. GDS-15

8. MNA-SF
3. Results: Kaplan-Meier plot (9)

9. CCI

10. Polypharmacy
3. Results: Kaplan-Meier plot (10)

Additional: ECOG-PS

Additional: ‘Gold standard’
3. Results: AIC values

<table>
<thead>
<tr>
<th>Covariates (age, carcinoma type, stage) + GA component</th>
<th>AIC value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Living situation</td>
<td>4911.925</td>
</tr>
<tr>
<td>• ADL dichotomous</td>
<td>4898.831</td>
</tr>
<tr>
<td>• ADL continuous</td>
<td>4880.003</td>
</tr>
<tr>
<td>• IADL dichotomous</td>
<td>4879.892</td>
</tr>
<tr>
<td>• IADL continuous</td>
<td>4868.074</td>
</tr>
<tr>
<td>• MOB-T dichotomous</td>
<td>4904.715</td>
</tr>
<tr>
<td>• MOB-T continuous</td>
<td>4885.446</td>
</tr>
<tr>
<td>• Fall history in the past 12 months</td>
<td>4910.242</td>
</tr>
<tr>
<td>• MMSE dichotomous</td>
<td>4892.322</td>
</tr>
<tr>
<td>• MMSE continuous</td>
<td>4889.860</td>
</tr>
<tr>
<td>• GDS15 dichotomous</td>
<td>4869.164</td>
</tr>
<tr>
<td>• GDS15 continuous</td>
<td>4863.150</td>
</tr>
<tr>
<td>• MNA-SF dichotomous</td>
<td>4876.632</td>
</tr>
<tr>
<td>• MNA-SF continuous</td>
<td>4857.399</td>
</tr>
<tr>
<td>• CCI dichotomous</td>
<td>4913.399</td>
</tr>
<tr>
<td>• CCI continuous</td>
<td>4903.359</td>
</tr>
<tr>
<td>• Polypharmacy dichotomous</td>
<td>4776.226</td>
</tr>
<tr>
<td>• Polypharmacy continuous</td>
<td>4773.660</td>
</tr>
</tbody>
</table>

*AIC values (the lower, the better)
### 3. Results: CPE + pseudo R-square

#### Table: Performance of GA models with inclusion of covariates

<table>
<thead>
<tr>
<th>Model</th>
<th>Covariates (age, carcinoma type, stage)</th>
<th>CPE (95% CI)</th>
<th>Pseudo R-square</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Covariates (age, carcinoma type, stage)</td>
<td>0.74 (0.72;0.76)</td>
<td>0.33</td>
</tr>
<tr>
<td>1</td>
<td>+ all GA components (10)</td>
<td>0.77 (0.75;0.79)</td>
<td>0.38</td>
</tr>
<tr>
<td>1</td>
<td>+ GA components (10; stepwise selection*)</td>
<td>0.77 (0.75;0.79)</td>
<td>0.38</td>
</tr>
<tr>
<td>2</td>
<td>+ G8 dichotomous</td>
<td>0.76 (0.74;0.78)</td>
<td>0.36</td>
</tr>
<tr>
<td>3</td>
<td>+ G8 continuous</td>
<td>0.77 (0.75;0.78)</td>
<td>0.38</td>
</tr>
<tr>
<td>4</td>
<td>+ fTRST dichotomous</td>
<td>0.75 (0.73;0.77)</td>
<td>0.34</td>
</tr>
<tr>
<td>5</td>
<td>+ fTRST continuous</td>
<td>0.76 (0.74;0.78)</td>
<td>0.35</td>
</tr>
<tr>
<td>7</td>
<td>+ ECOG-PS continuous</td>
<td>0.76 (0.74;0.78)</td>
<td>0.35</td>
</tr>
<tr>
<td>8</td>
<td>+ ‘gold standard’ (7 var. cut-off = 2)</td>
<td>0.75 (0.73;0.77)</td>
<td>0.34</td>
</tr>
</tbody>
</table>

(*) Included variables: Living situation, IADL, MNA-SF
CPE: Concordance Probability Estimate, CI: Confidence Interval
4. Conclusion

- Geriatric screening and geriatric assessment components, except living situation and falls, are all prognostic for OS based on Kaplan-Meier plots.

- Covariates itself (age, carcinoma type, stage) have an important prognostic value for OS.

- GA models have an independent additional prognostic value for OS, although the strength is limited.
4. Conclusion (2)

- By comparison of all GA models, the following three models are the most prognostic for OS:
  - Covariates +
    - All GA components
    - All GA components (‘stepwise selection’: ‘living situation, IADL, MNA-SF’)
    - G8 continuous

- Additional prognostic value of fTRST, ECOG-PS and ‘gold standard’ is limited.
Take home message

Although the covariates (age, carcinoma type, stage) have an important prognostic value for OS that can be strengthened by additional GA models, a major part stays ‘unpredictable’.

The development of prognostic models in geriatric oncology is warranted but it should be recognized that a prognostic model shall not and will never be perfect…
Thanks for your attention!

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