JOURNAL OF GERIATRIC ONCOLOGY 7 (2016) 90–98

Available online at www.sciencedirect.com

ScienceDirect

Clinical Trials

# Comparing comorbidity scales: Attending physician score versus the Cumulative Illness Rating Scale for Geriatrics

*Lene Kirkhus*[a,*], *Marit Jordhøy*[b,c], *Jūratė Šaltytė Benth*[a,c,d], *Siri Rostoft*[e], *Geir Selbæk*[a,f], *Marianne Jensen Hjermstad*[g,h], *Bjørn H. Grønberg*[i,j]

[a]*The Centre for Old Age Psychiatry Research, Innlandet Hospital Trust, P.O. Box 68, 2312 Ottestad, Norway*
[b]*The Cancer Unit, Innlandet Hospital Trust Hamar, Skolegata 32, 2326 Hamar, Norway*
[c]*Institute of Clinical Medicine, University of Oslo, Oslo, Norway*
[d]*HØKH, Research Centre, Akershus University Hospital, Oslo, Norway*
[e]*Department of Geriatric Medicine, Oslo University Hospital (OUS), Oslo, Norway*
[f]*Norwegian Advisory Unit on Ageing and Health, Vestfold Hospital Trust, Tønsberg, Norway*
[g]*Regional Centre for Excellence in Palliative Care (KSLB), Department of Oncology, Oslo University Hospital Ullevål (OUS), Oslo, Norway*
[h]*The European Palliative Care Research Centre, Department of Cancer Research and Molecular Medicine, Norwegian University of Science and Technology, Trondheim, Norway*
[i]*The Cancer Clinic, St Olavs Hospital, Trondheim University Hospital, Trondheim, Norway*
[j]*Department of Cancer Research and Molecular Medicine, Norwegian University of Science and Technology, Trondheim, Norway*

## ARTICLE INFO

*Article history:*
Received 2 September 2015
Received in revised form
18 November 2015
Accepted 8 December 2015
Available online 28 December 2015

*Keywords:*
Comorbidity
CIRS-G
Advanced NSLCL
Survival

## ABSTRACT

*Objectives:* Assessing comorbidity using the Cumulative Illness Rating Scale for Geriatrics (CIRS-G) and its comprehensive manual is time consuming. We investigated if similar information could be obtained by a simpler assessment based on the original CIRS.
*Materials and Methods:* Data from a randomized chemotherapy trial (RCT) on advanced NSCLC (non-small cell lung cancer) were analyzed. Baseline comorbidity was assessed by 1) trained oncologists using hospital records and the CIRS-G manual (CIRS-G), 2) by patients' oncologists/pulmonologists (local investigators = LI-score) using a brief set of instructions. By both methods, the severity of comorbidity in 14 organ systems was graded 0 (no problem) to 4 (extremely severe). The agreement between methods was assessed using Bland–Altman analysis and weighted kappa statistics. The impact of comorbidity on survival was analyzed by Cox regression.
*Results:* Complete data were available for 375/446 (84%) patients enrolled in the RCT. Median age was 65 years (25–85). Overall, more comorbidities and higher severity were registered by the CIRS-G compared to the LI-score. Severe comorbidity was registered for 184 (49%) and 94 (25%) patients according to the CIRS-G and LI-scores, respectively. Mean total score was 7.0

* *Corresponding author*. Tel.: +47 48 13 38 17 (Mobile); fax: +47 62 58 14 01.
E-mail addresses: l_kirkhus@hotmail.com (L. Kirkhus), mjorhoy@gmail.com (M. Jordhøy), jurate.saltyte-benth@medisin.uio.no (J. Šaltytė Benth), srostoft@gmail.com (S. Rostoft), geir.selbaek@aldringoghelse.no (G. Selbæk), marianne.j.hjermstad@ntnu.no (M. Jensen Hjermstad), bjorn.h.gronberg@gmail.com (B.H. Grønberg).

http://dx.doi.org/10.1016/j.jgo.2015.12.003

(0–17) (CIRS-G) versus 4.2 (0–16) (LI-score), and mean severity index (total score/number of categories with score >0) was 1.73 (SD 0.46) versus 1.43 (SD 0.78). Neither the CIRS-G scores nor the LI-scores were prognostic for survival.

*Conclusion:* The CIRS-G scores and LI-scores had poor agreement, indicating that assessment method affects the registration of comorbidity. Thorough descriptions of comorbidity registrations in trials are paramount due to lack of a standardized assessment.



## 1. Introduction

The proportion of older patients with cancer is increasing, and comorbidity is more frequent in older age.[1–3] Comorbidity is reported as an independent prognostic factor for survival in patients with cancer.[4–6] Whether this is a result of the comorbid disease itself or caused by inferior treatment is not clear. However, it is known that patients with cancer with higher comorbidity burden are less likely to receive similar tumor treatment as their healthier counterparts.[7, 8] This may be caused by an assumption of less benefit from treatment due to shorter survival expectancy. It may also be due to concerns about more toxicity, as indicated in some studies.[9, 10] The association between treatment tolerability and various coexisting diseases has, however, been poorly investigated. To better understand how patients with coexisting diseases should be treated, a valid method for systematic assessment of comorbidity in clinical trials is required.

Several methods for assessing comorbidity have been developed. Among the most commonly used are the Charlson Comorbidity Index (CCI) and the Cumulative Illness Rating Scale for Geriatrics (CIRS-G).[11–13] CCI is the most widely used. It is easy to complete and can be scored from hospital charts or by using the International Classification of Diseases (ICD) codes for diagnoses.[14,15] The original CIRS scale was developed by Linn et al.[16] Comorbidity was classified according to organ system and graded on a scale from 0-4. Miller et al modified CIRS to better reflect the geriatric patient,[13] developed a scoring manual[17] and renamed the scale as CIRS-G. The CIRS-G manual has later been updated according to changes in diagnostic criteria and treatment of common diseases.[18] In comparison to CCI, CIRS-G is more sensitive since all coexisting diseases are registered,[11] and in comparative studies, it appears to provide more prognostic information.[19] It is, however, more time-consuming and less feasible in multicenter studies since assessment by specifically trained personnel is recommended.[11]

The present study is based on data from a Norwegian multicenter phase III trial comparing two first-line chemotherapy regimens in advanced non-small cell lung cancer (NSCLC).[20] When patients were enrolled, the patients' oncologists/pulmonologists were asked to assess comorbidity in 14 organ systems using a brief set of instructions based on the original CIRS[16] (local investigator-score = LI-score). Later, trained researchers (oncologists) at the trial office assessed the patients' comorbidity from the medical records using the CIRS-G manual (CIRS-G).[17] The aim was to compare the LI-scores to the CIRS-G scores, and to assess the agreement between these scores. We also aimed to explore the prognostic impact of the LI-score. In a previous publication, no association between the CIRS-G scores and survival in this cohort of patients was reported.[9] Our hypothesis was that the local investigators, with detailed knowledge about their patients, were better at identifying the comorbidities that were likely to affect the patients' prognosis, and hence that these scores might be associated with survival.

## 2. Materials and Methods

### 2.1. Patients

Patients enrolled in a phase III trial comparing gemcitabine/carboplatin with pemetrexed/carboplatin as first-line treatment of advanced NSCLC were considered for the present study.[20] Eligible patients had given written informed consent, completed the baseline European Organisation for Research and Treatment of Cancer Quality of Life Core Questionnaire (EORTC QLQ-C30), received at least one cycle of chemotherapy and both LI-score and CIRS-G scores were available (Fig. 1). No differences in overall survival or quality of life (QoL) between the two trial arms were reported in the main trial, and there were only minor differences in toxicity.[20] Thus, all patients were analyzed jointly.

### 2.2. Assessment of Comorbidity

Both local investigators (oncologists and pulmonologists) and the oncologists who performed the CIRS-G scores assessed the severity of coexisting diseases in 14 organ systems/scales in accordance with the CIRS-G comorbidity index. Severity ranged from 0 to 4: "0" indicating no problem, "1" a current mild problem or past significant problem, "2" a moderate disability or morbidity requiring "first-line" therapy, "3" a

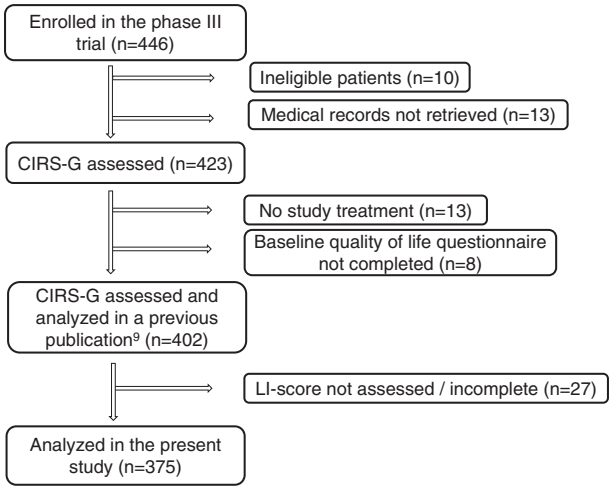


**Fig. 1 – Patient selection.**