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Comprehensive Geriatric Assessment (CGA) in general practice: Results from a pilot study in Vorarlberg, Austria

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Abstract

Background: Most comprehensive geriatric assessment (CGA) programs refer to hospital-based settings. However the body of geriatric healthcare is provided by general practitioners in their office. Structured geriatric problem detection by means of assessment instruments is crucial for efficient geriatric care giving in the community.

Methods: We developed and pilot tested a German language geriatric assessment instrument adapted for general practice. Nine general practices in a rural region of Austria participated in this cross-sectional study and consecutively enrolled 115 persons aged over 75 years. The prevalence of specific geriatric problems was assessed, as well as the frequency of initiated procedures following positive and negative tests. Whether findings were new to the physician was studied exemplarily for the items visual and hearing impairment and depression. The acceptability was recorded by means of self-administered questionnaires.

Results: On average, each patient reported 6.4 of 14 possible geriatric problems and further consequences resulted in 43.7% (27.5% to 59.8%) of each problem.

The items with either the highest prevalence and/or the highest number of initiated actions by the GPs were osteoporosis risk, urinary incontinence, decreased hearing acuity, missing pneumococcal vaccination and fall risk. Visual impairment was newly detected in only 18% whereas hearing impairment and depression was new to the physician in 74.1% and 76.5%, respectively.

A substantial number of interventions were initiated not only following positive tests (43.7% per item; 95% CI 27.5% to 59.8%), but also as a consequence of negative test results (11.3% per item; 95% CI 1.7% to 20.9%).

The mean time expenditure to accomplish the assessment was 31 minutes (SD 10 min). Patients (89%) and all physicians confirmed the CGA to provide new information in general on the patient's health status. All physicians judged the CGA to be feasible in everyday practice.

Conclusion: This adapted CGA was feasible and well accepted in the general practice sample. High frequencies of geriatric problems were detected prompting high numbers of problem-solving initiatives. But a substantial number of actions of the physicians following negative tests point to the risks of too aggressive treatment of elderly patients with possibly subsequent negative effects.

Background

In the Austrian health care system, general practitioners provide care for more than 90% of the population aged over 75 years. For general practitioners in rural as well as urban regions, effective support strategies for geriatric patient problems are indispensable.

From studies several decades ago it is known that high numbers of undetected problems exist in elderly people, highlighting the need for a systematic approach to geriatric problem detection [1,2]. Subsumed as comprehensive geriatric assessment (CGA) many initiatives have been started within the last years [3-5]. Today evidence from randomised controlled trials or systematic reviews on CGA is increasingly available, supporting the use of hospital-based programs with extended ambulatory follow-up [6] and preventive home visits based on CGA with multiple follow-up [7,8]. The study samples refer to hospital-based and long term multidimensional care settings, performed by groups of geriatricians, geriatric nurses or other specialised health care providers. But working conditions in the general practitioners' offices and the characteristics of a community dwelling geriatric population differ from the settings providing the main evidence up to now.

Therefore, for the implementation of such an instrument in general practice, it is important to recognize the special requirements of the primary care setting. Limited consultation time and small office staffs can cause problems for the adoption of the CGA. Thus, for the use in primary care, the CGA should be concise, easy to perform and take no more than 30 minutes [9,10].

The aim of our study was to adapt and pilot a CGA instrument in German Language, to measure the prevalence of specific geriatric socio-medical problems in the Austrian senior population and to analyse the subsequent management applied by the primary care physicians. The instrument was to be tested regarding its applicability in daily practice and its acceptability for patients and physicians.

Methods

Study design and participants

We performed a cross-sectional study in nine general practices in Vorarlberg, a rural area of Austria. All general practitioners recruited built a convenience sample from a management quality circle.

Patients were equally recruited from all practices. Eligibility criteria were: age over 75 years and the capability to attend the GPs office. We excluded persons with a terminal illness or with a known pre-existing diagnosis of severe dementia. These criteria focused on elderly patients who would most likely benefit from CGA [8]. Patients were assigned prospectively and consecutively to the study, which took place between December 2001 and April 2002. All patients gave written informed consent and agreed to schedule an appointment in the next days for fasting laboratory tests and for the assessment.

Screening instrument

The screening instrument was developed by reviewing the literature with focus on the most common socio-medical geriatric health problems regarding epidemiology and treatment options [5,7,9,11]. Table 1 shows the assessment checklist with the covered areas. For each category we gave pre-specified answers with cut-off values for positive and negative screening tests. For the subsequent management of positive findings, we proposed common-practice problem solving strategies.

We collected information from the physicians on whether a finding was new to them in an exemplary subset of the variables visual acuity, hearing acuity and depression. We did not collect data on new diagnoses for all clinical domains, because our primary aim was a systematic inventory taking of geriatric problems and its feasibility in the primary care setting.

Prior to the start of the study we gave an introduction of 6 hours to all participating GPs' on the use of the assessment instrument.

Physicians' acceptability

All physicians recorded their time expenditure to complete the screening assessment. Any further actions invoked within the assessment were not part of the time measurement. We recorded the acceptability of the CGA by the practitioners with a self-administered questionnaire. Physicians specified whether the CGA revealed new information about their patients, whether they had any suggestions for improving the CGA and whether they perceived the CGA to be suitable for the general practice setting.

Table 1: Geriatric assessment chart

Target problem	Diagnostic test	Cut-off value	Management strategies
Visual acuity	Jaeger's test [37]	≤20/40	Referral to ophthalmologist
Hearing acuity	Whisper test [38]	Failure to correctly repeat 3 whispered numbers	Removal of ear wax Referral to otolaryngologist
Urinary incontinence	IKO-4-Test [39]	4 defined questions ≥1 question answered positive	Change of existing drug prescription Pelvic floor muscle training Drug treatment Planning of in-depth exploration by GP Referral to urologist or gynaecologist
Depression	Geriatric depression scale, short version (GDS 4) [33]	4 defined questions ≥1 question answered positive	New antidepressant drug therapy Change of drug prescription Non-drug treatment strategy Planning of in-depth exploration by GP Referral to psychiatrist
Cognitive impairment	Memory Assessment Clinics Questionnaire (MAC-Q) [40]	6 defined questions (Score range 7 – 35) Score ≥25 suggestive of cognitive impairment	Follow-up examination in 6 months¶ Referral for memory assessment to neurologist or psychiatrist
ADL and IADL †	Katz's ADL scale (4 questions) [41] Two questions from Lawton [42]	Score ≤7 impairment of functioning in daily living (total score 0–9).	Planning of in-depth exploration by GP Referral according to underlying problem
Psychosocial circumstances	Do you have trustworthy persons giving you assistance at home? [43]	Yes/No	Contact with community nurse, neighbours or relatives
Sleep disorder	Do you suffer from frequent sleeping problems?	Yes/No	Non-Drug therapy Change of drug prescription Drug treatment Planning of in-depth exploration by GP Referral to psychiatrist/internist.
Influenza and pneumococcal Immunisation	Influenza vaccination within a one-year period [24] Pneumococcal vaccination within a three-year period [44]	Yes/No	Influenza or pneumococcal vaccination
Fall risk assessment	History of falls Timed Up and Go Test [45] Tandem – Stand Test [46]	Fall within last 6 months >20 s suggestive of balance or gait difficulties Score 0–4: >1 suggestive of balance or gait difficulty	Exploration of drug prescription Hip protector Source exploration Replacement of footwear initiated Instructed exercise training
Cardiovascular risk assessment	Lipid profile (mmol/l) [47,48] Blood pressure (mm Hg) [50] Hyperglycemia [51]	Chol > 5.95 mmol/l LDL > 3.36 mmol/l HDL < 1.16 mmol/l TG > 4.6 mmol/l BP_{syst} > 140 mmHg BP_{diast} > 80 mmHg Fasting blood glucose > 6.1 mmol/l	Change or onset of antilipidemic drug treatment Change or onset of antihypertensive drug treatment Change or onset of oral antidiabetic drug or insulin
Medication history	Number of prescribed drugs Number of over the counter medications [43]	>5 prescription drugs >3 over the counter drugs.	
Hospital stay	Hospital stay within a 5-months period [43]		
Nutrition	Body mass index	BMI normal range for the elderly 24 – 29, Waid Guide [52]	Planning of in-depth exploration by GP
Osteoporosis risk factors	9 items risk factor checklist [53]	Female sex Prior spontaneous fracture Family history of osteoporosis Immobilisation Premature menopause Glucocorticoid treatment Smoking Alcohol abuse Low body weight	Calcium and Vitamin D Bisphosophonate Selective estrogen-receptor modulator Calcitonin

† Basic and instrumental activities of daily living. ¶ Only for borderline cases (MAC-Q 22–24 points)

Patients' acceptability

We collected data on the patients' perception of the CGA equally by means of a self-administered questionnaire. Patients specified 1. whether they received new information on their health status 2. whether they considered annual follow-ups of the CGA to be beneficial for their well-being 3. The willingness to pay personally for the health assessment 4. whether they felt embarrassed about the detailed assessment 5. whether the CGA missed any important health issues.

Data on patient acceptability were collected during and after performance of the CGA and either returned to the GP directly or sent to the study coordinator by post. Data were collected only once, follow-up data are not available.

Data analysis

Disease prevalence of this descriptive analysis is estimated by the number of people with a positive screening test out of those examined. Further, any diagnostic or treatment efforts taken by the primary care physicians were analysed in relation to positive or negative screening results by means of 2 × 2 contingency tables for each screening item.

We supposed that screening items which are practically relevant for the physicians might either have a high prevalence and/or might be followed by a high frequency of diagnostic or treatment efforts initiated by the GPs. To therefore generate a rank order of more or less relevant items, we calculated the product of the prevalence times the total proportion of diagnostic or treatment actions initiated by the physician for each item. Items with a high prevalence and/or a high frequency of consequences taken by the GPs reached high product scores and were ranked in descending order in Table 4.

We assessed associations between age (by year), sex (female sex) and the risk for a positive screening test fitting logistic regression models, accounting for the effect of clustering.

Since observations on individuals within the same general practice may be correlated, all analyses took account of the clustering effect in the variance estimation. All analyses were performed using STATA 8.0. We used the survey method of STATA for analysis. The general practice was the primary sampling unit.

Results

Demographic data

The study took place between December 2001 and April 2002. Nine general practitioners volunteered to take part in the study. Their general practice experience varied between 7 and 22 years. Three of nine were female doctors.

124 patients were consecutively enrolled in the study; the data from nine patients had to be excluded because of incomplete data collection. The patients' baseline characteristics are shown in Table 2.

Table 2: Patients baseline characteristics as recorded in the CGA chart (n = 115)

Age years (mean, SD)	77.9 (3.8)
Female sex (%)	85 (73.9%)
Number of geriatric problems (mean, SD)	6.4 (2.7)
Social circumstances	
Living at home (No, %)	113 (98%)
Living alone (No, %)	53 (46%)
No limitations in Instrumental Activities of Daily Living (IADL)	94 (81.8%)
Hospital stay within a 5-months period	30 (26.5%)
Nutrition	
BMI, mean (mean, SD)	26.4 (4.5)
Overweight (BMI > 29)	31 (27.0%)
Underweight (BMI < 24)	38 (33%)
Cardiovascular risk factors other than age ¶	84 (73.0%)
Hypertension	68 (60.2%)
Diabetes	21 (18.6%)
Hyperlipidemia	39 (34.5%)
Smoking	7 (6.2%)
Multiple medication use	
>5 prescription drugs	47 (41.2%)
>3 over the counter drugs	3 (6.3%)
Fall within a 5-months period	28 (25.0%)

¶ Refer to risk factors in the medical history of the patient known prior to CGA

Table 3: Prevalence of positive assessment test results

Problem	No	Prevalence	95% CI
Pneumococcal vaccination longer than three years ago (n = 113)	93	82.3%	65.4 to 92.0%
Osteoporosis risk (n = 115)	81	70.4%	57.0% to 81.1%
Urinary incontinence (n = 112)	76	67.9%	53.8% to 79.3%
Hyperlipidemia at assessment (n = 113)	66	57.4%	46.7% to 67.4%
Cognitive impairment (n = 114)	63	55.2%	41.7% to 68.1%
Hearing loss (n = 114)	58	50.9%	38.7% to 62.9%
Hypertension at assessment (n = 111)	53	47.8%	28.1 to 68.1%
Last influenza vaccination longer than one year ago (n = 114)	52	45.6%	7.1% to 54.4%
Fall risk or balance and gait difficulties (n = 115)	48	41.7%	34.5 to 49.4%
Sleep disorder (n = 114)	42	36.8%	24.6% to 51.0%
Depression (n = 114)	34	29.8%	19.1% to 43.3%
Low vision (n = 110)	32	29.1%	13.8 to 51.3%
Hyperglycemia at assessment (n = 112)	28	25.0%	16.2% to 36.6%
Psychosocial deprivation (n = 113)	8	7.1%	3.1% to 15.3%

Table 4: Number of disease management actions undertaken by the GPs following positive or negative test results.

Problem	Number of actions following positive test			Number of actions following negative test			Product score §
	No	% †	95% CI	No	% ‡	95% CI	
Osteoporosis risk (n = 115)	62	76.5	57.4 to 88.8	21	61.7	30.8 to 85.4	0.51
Urinary incontinence (n = 112)	51	67.1	52.2 to 79.2	3	8.3	2.6 to 23.3	0.33
Hearing loss (n = 114)	38	65.5	48.7 to 79.2	1	1.8	0.2 to 15.3	0.17
Pneumococcal vaccination longer than 3 years ago (n = 113)	19	20.4	7.2 to 46.2	4	20.0	5.8 to 50.4	0.17
Fall risk or balance and gait difficulties (n = 115)	22	45.8	28.1 to 64.7	16	23.9	7.1 to 56.3	0.14
Sleep disorder (n = 114)	31	73.8	52.0 to 88.0	2	2.8	0.6 to 28.1	0.11
Influenza vaccination longer than one year ago (n = 114)	8	15.4	2.2 to 60.4	12	19,4	7.8 to 40.6	0.08
Low vision (n = 110)	21	65.6	43.2 to 82.8	8	10.3	3.4 to 27.3	0.08
Cognitive impairment (n = 114)	12	19.1	10.3 to 32.5	1	2.0	0.2 to 17.0	0.06
Depression (n = 114)	20	58.8	29.7 to 82.9	1	1.3	0.1 to 12.6	0.05
Hyperlipidemia at assessment (n = 113)	9	13.6	5.5 to 30.0	0	0		0.04
Hypertension at assessment (n = 111)	4	7.5	3.4 to 16.0	0	0		0.02
Psychosocial deprivation (n = 113)	6	75.0	37.0 to 93.9	7	6.6	1.9 to 21.3	0.01
Hyperglycemia at assessment (n = 112)	2	7.1	1.4 to 29.4	0	0	0	0.01

§Product score to generate a rank order of practical relevance: Product of prevalence times the proportion of any actions following either positive or negative test results. † In relation to prevalences displayed in Table 3. ‡ In relation to negative tests [total (n) – number of positive tests] in Table 3.

Geriatric assessment

Table 3 shows the prevalence of each screened problem. The frequency of any actions taken by the physicians – as a consequence of a positive test result or following negative test results – are shown in table 4. The items in table 4 are listed in a descending rank order according to the decreasing product score of practical relevance. The detailed management actions undertaken by the physicians irrespective of the screening result are specified in table 5.

On average, each patient reported 6.4 of 14 possible problems. Overall diagnostic or therapeutic consequences were taken in 23.9% per patient and test item (95% CI 13.0% to 34.7%) and in 43.7% (95% CI 27.5% to 59.8%) following positive test results.

The test items with either the highest prevalence or the highest proportions of actions undertaken by the GPs were osteoporosis risk, urinary incontinence, decreased hearing acuity, missing pneumococcal vaccination and increased fall risk.

Table 5: Frequencies of detailed management actions undertaken by the physicians following positive or negative screening tests.

Problem	All actions		Detailed actions ¶		
	No	% †		No	% †
Osteoporosis risk assessment (n = 115)	83	72.1	DXA bone measurement	76	66.1
			New prescription of Vitamin D3 and Calcium	58	50.4
			New estrogen replacement therapy	1	0.9
			Bisphosophonate	22	19.1
			Calcitonin	0	0
			Selective estrogen-receptor modulator therapy	1	0.9
Urinary incontinence (n = 112)	54	47.0	Pelvic floor muscle training	21	18.8
			Change of drug prescription	7	6.3
			Planning of in depth exploration by GP	17	15.2
			New drug prescription	15	13.4
			Referral to urologist or gynaecologist	11	9.8
Hearing loss (n = 114)	39	33.9	Removal of ear wax	15	13.2
			Referral to otolaryngologist	29	25.4
Fall risk or balance and gait difficulties (n = 115)	38	33.1	Change of drug prescription	4	3.5
			Hip protector	3	2.6
			Environmental source exploration	20	17.4
			Information on safer footwear	25	21.7
			Instructed exercise training	7	6.1
			Planning of in-depth exploration by GP	5	4.3
Sleep disorder (n = 114)	33	28.7	New drug prescription	16	14.0
			Change of drug prescription	2	1.8
			Non- drug therapy	13	11.4
			Planning of in-depth exploration by GP	5	4.4
Low vision (n = 110)	29	26.4	Referral to ophthalmologist	29	26.4
Pneumococcal vaccination longer than 3 years ago (n = 113)	23	20.0	Pneumococcal vaccination	23	20.4
Depression (n = 114)	21	18.3	New antidepressant drug therapy	7	6.1
			Change of drug prescription	2	1.8
			Non-drug treatment	10	8.8
			Planning of in-depth exploration by GP	9	7.9
			Referral to psychiatrist	1	0.9
Influenza vaccination longer than one year ago (n = 114)	20	17.4	Influenza vaccination	20	17.4
Psychosocial deprivation (n = 113)	14	12.3	Contact with relatives	7	6.1
			Contact with neighbours	4	3.5
			Contact with community nurse	6	5.3
			Contact with social worker	1	0.9
Cognitive impairment (n = 114)	13	11.4	Follow up in six months	37	32.5
			Referral to neurologist/psychiatrist	13	11.4
Hyperlipidemia at assessment (n = 113)	9	7.9	Antilipidemic drug treatment	9	7.9
Hypertension at assessment (n = 111)	4	3.6	New or additional drug prescription	4	3.6
Hyperglycemia at assessment (n = 112)	2	1.8	New or additional drug prescription	2	1.8

† Percentage related to all participants ¶ Multiple notations possible

The items hyperlipidemia, hypertension, and hyperglycemia had a fairly high prevalence, but general practitioners initiated further work-up's only in 1.8% to 7.9% of all of cases.

The investigation of whether a detected problem was a new finding for the practitioner was exemplarily done for visual acuity, hearing acuity and depression. In only 6 of 33 cases (18.2%) visual impairment was new to the physician whereas for hearing impairment and depression this information was new in 43 of 58 (74.1%) and 26 of 34 (76.5%) cases, respectively.

In contrast, in a substantial number of 10.7% (95% CI 0.3% to 21.0%) of all cases per item diagnostic or therapeutic procedures were initiated by the physicians despite negative results in the screening. Considerable variability existed in the number of actions following negative tests over the different items, most important concerning osteoporosis risk, fall risk and the immunisation interventions (Table 4).

Table 6: Independent significant associations of risk of the particular screening item by age and sex

Screening item	Age		Female sex	
	Odds ratio *	95% CI	Odds ratio *	95% CI
Fall risk	1.11	1.001 to 1.23	2.15	1.06 to 4.37
Cognitive impairment	n.s.		2.28	1.10 to 4.73
Depression	n.s.		5.16	1.64 to 16.25
Visual impairment	1.18	1.04 to 1.34	2.93	1.29 to 6.68

* Odds ratios are deviated from logistic regression models taking into account cluster sample design. They represent the increased odds of being at risk for a presented item associated with age (by each year) or by being female.

Significant associations between sex, age and the particular screening item are illustrated in Table 6, non-significant associations are omitted. For every significant association, female patients were clearly at higher risk, after controlling for age. This finding was most obvious for depression.

Physicians' acceptability of geriatric assessment

The mean time expenditure to solely accomplish the entire geriatric assessment was 31 minutes (SD 10 min), with a minimal requirement of 18 minutes to a maximum of 45 minutes.

All nine physicians confirmed that the geriatric assessment provided new information in general on their patients' health status and that it was feasible in everyday practice. By comments, three of the nine practitioners mentioned that the screening of dementia by means of the MAC-Q Test is inadequate.

Patients' acceptability of geriatric assessment

All but four patients returned the self-administered questionnaire. 99 (89%) of 111 patients estimated the CGA to be potentially supportive for their health condition and well-being; the remaining 11% were sceptical or negative. In 55%, patients stated the CGA to provide new information on their health status, mainly in the area of sensomotory dysfunction (vision, hearing), cognitive impairment and osteoporosis risk. 103 of 111 (93%) wished to attend regular CGA follow-up assessments and 62 of 111 (56%) confirmed the willingness to pay personally for it. The most commonly mentioned missing topics from the patients' point of view were dental health, sexuality, tremor and joint affections. Only a minority of four patients felt embarrassed by the examination.

Discussion

We have presented the results of a Pilot-Initiative to implement a multidimensional geriatric assessment instrument in a general-practice population in Vorarlberg, Austria. This German-Language instrument was tailored for the use in the GP's office.

Six out of 14 geriatric health problems were identified on average in each patient and nearly half of the positive test items led the physician to take further actions. However initiatives taken by the physicians strongly depend on whether patient problems were previously known or not. We did not systematically score new findings as such throughout the assessment because the primary goal was to test feasibility and focused on initial problem inventory taking. Exemplarily we investigated the gain of new information for the items vision, hearing and depression and found considerable variation ranging from a proportion of only 18% of new cases for low vision up to 76% for depression. Junius [12-14] reported that less than half of registered health problems in a CGA were known to the GP's.

Osteoporosis risk, urinary incontinence, reduced hearing acuity, missing pneumococcal vaccination and fall risk were the problems with either the highest prevalence or highest frequency of initiated steps by the physicians. Mainly items on functional impairment and prevention resulted in high number of initiatives taken by the doctors. We suggest that these aspects of the assessment yielded new information on patient problems because these aspects are not usually covered in routine visits to the GP. In contrast, few diagnostic or therapeutic consequences were initiated after GPs detected hyperlipidemia, hypertension or hyperglycemia, despite considerable prevalence rates. We are not able to specify on the basis of our data why a certain discrepancy was found between higher proportions of actions taken after the detection of functional impairment or missing preventive measures (e.g. vaccination) than after measuring pathologic values of plasma lipids, blood pressure or blood glucose. We suggest that physicians have a rather critical attitude towards interventions aiming to increase life expectancy. In addition caution towards risks of multiple medication use or over-treatment might have been an important reason for

the restricted use of for example lipid lowering agents [15]. Also a single elevated blood pressure value or elevated fasting blood glucose measurement was not considered to justify an immediate drug therapy in every case and may explain the limited initiatives of the GPs' towards these positive test findings. Nevertheless, the study population consisted of a rather fit group of independent community-dwelling elderly and in certain cases starting treatment can be justified (e.g. combination of cardiovascular risk factors) [16].

We found a high number of actions taken to further assess and treat osteoporosis. In two thirds of all participants DEXA bone measurements were initiated, mainly in women and in singular cases of men at risk (e.g. corticosteroid treatment). But the proportion of DEXA orders varied considerably between physicians. According to the SCORE [17,18] and ORAI [18,19] decision rules, elderly female patients within the CGA basically qualify for BMD measurements, but no clear recommendations exist for men [20]. This high number of performed BMD tests during the assessment may reflect a study effect rather than the real attitude of primary care physicians towards BMD-tests. The between-physician variation in the frequency of testing for osteoporosis points towards the problems among family physicians on the management of osteoporosis and on the educational needs on osteoporosis management in primary care [21].

Pneumococcal and influenza vaccinations are widely recommended preventive actions in the elderly population in many European countries and the USA [22-24]. The level of vaccination in our population considerably differed between the flu shot (54%) and pneumococcal vaccination (18%). The data are similar to other German-speaking countries [25], but are low compared to US rates [26,27]. The difference in the coverage between influenza and pneumococcal vaccination in our population reflects the lower acceptance for the pneumococcal vaccine. Promotion for pneumococcal vaccination was being performed only recently [28].

For cognitive impairment patients were referred to specialists in 19% of positive results. For most patients physicians ordered a follow-up after six months although in the protocol a simple follow-up was proposed only for borderline cases (MAC-Q 22–24 points). Participating GPs reported to refrain from undertaking further steps because of limited treatment options [29].

Fall risk was prevalent in nearly half of all patients and was followed in nearly half of all positive cases. Patients' low compliance for exercise programs and hip protectors was the reason for low treatment rates [30].

Hearing was more commonly impaired than vision [31,32]. Vision was tested with corrective lenses in most cases whereas acoustically impaired patients were equipped with hearing aids only rarely.

Positive testing for depression was identified in up to one third of the senior population and it was strongly associated with the female sex, but not age. We incorporated the GDS-4, a short version of the GDS-15 in the CGA. With a sensitivity of 89% and specificity 65% most patients are identifiable, depending on the severity of the condition [33]. Within the study setting physicians were aware not to miss this treatable condition and judged further efforts necessary in about 60% of positively screened cases. This exceeds the generally low number for referral or treatment for depression in general practice [34].

Compared to other prevalence studies in the elderly 75+ primary care population in Europe [35] we saw broadly about twofold higher prevalences of common problems in our setting, although we assume to have assessed a rather fit elderly population. Not population differences but rather the sensitivity and specificity of the different screening tests might explain the discrepancy. Within the framework of the geriatric screening, the instrument should be simple and easy to handle in general practice, but at the expense of perhaps a substantial number of false positive results leading to over-diagnosis and the risk of over-treatment.

A considerable proportion of diagnostic or therapeutic consequences were initiated even though negative test results had been recorded. In fact for the items osteoporosis risk, fall risk, lack of influenza or pneumococcal vaccination and low vision consequences following negative results were ascertained in 10% up to 62%. Hence some physicians have expanded their efforts after negative tests what might reflect some lack of trust of the GPs' in CGA although impeccable scores of acceptability were quoted in the questionnaire. In addition, patients might have complained about symptoms outside the protocol leading to further interventions. Generally this finding points to a risk that through the accomplishment of CGAs some physicians tend towards over-treatment of elderly patients with potential negative side-effects.

In our population of relatively fit seniors, CGA was welcomed by most patients and physicians as a part of regular health checks. CGA, requiring about half an hour of consultation time was judged to be feasible in daily practice routine. But the time expenditure to initiate further, especially complex work-up is not accounted for in this half an hour. According to patients, we missed important screening items like dental health, sexuality, tremor and joint affections.

Further research should focus on the effectiveness of systematic screening as well as on potential negative effects like over-diagnosis, labelling and over-treatment of geriatric patients through CGAs. The MRC-Trial of assessment and management of older people in the community addresses these questions of effectiveness and its results will bring further clarity [36]. The validation of a German instrument should include effectiveness and practical relevance, as pointed out in this study.

Limitations

Cognitive impairment was found in 55% of all participants screened and restrictions apply either to the MAC-Q test with a high false-positive rate or test results requiring intellectual or memory capacities must be interpreted with caution.

Statements on the physicians' acceptability might be generalised only with restriction, because the participating physicians are a convenience sample of physicians with a higher than average interest in geriatric health care problems.

We performed no follow-up assessments. Repeated measurements of the score of patient consent and physicians' acceptability during follow-up would add import information. Patients experiencing side effects of over-eager doctors, of embarrassing diagnostic procedures or limited therapeutic possibilities might criticize the CGA later resulting in decreasing patient consent.

Conclusion

Our pilot study showed that an adapted version of a CGA detects a high prevalence of geriatric problems prompting a high number of consecutive diagnostic and therapeutic interventions mainly in the field of functional impairment and prevention. It is applicable in general practice and shows good acceptability. Physicians ostensibly appreciate being guided by the CGA but in some aspects preserve autonomy for decision making.

The CGA should not be seen as an isolated screening instrument, but rather as a clinical checklist to approach elderly patients in general practice. There might be a positive impact on quality of life, but on the same time it carries the risk of side effects of over-diagnosis and too aggressive treatment.

Competing interests

None declared.

Authors' contributions

EM and CM designed the study. MTK analysed the data. All authors participated in the interpretation of the results and the writing of the paper. EM and MTK are guarantors for the paper.

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