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THE HIGH DIAGNOSTIC YIELD OF A GERIATRIC OUTPATIENT CLINIC

TRAVAIL DE MASTER

FLORENCE MORET

TUTEUR: PROF. CH.BÜLA
CO-TUTEURS: DRESSE S.MONOD, DRESSE H.JACCARD RUEDIN

STATISTICIENNE: S.FUSTINONI

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Abstract

Objectives: To determine characteristics of older patients referred to a geriatric outpatient clinic; 2) to determine the prevalence of geriatric syndromes in this population; 3) to identify main recommendations made to referring primary care physicians.

Design: Cross-sectional analysis

Setting: Outpatient clinic of the service of geriatric medicine at the University of Lausanne Medical Center, Lausanne, Switzerland.

Participants: Community-dwelling patients aged 65 and over referred to the clinic.

Measurements: Demographics, social, functional and health status data, main diagnoses identified and recommendations made for primary care physicians were collected prospectively.

Results: Subjects (N=206, mean age 79.7±7.6 years, 57.3% women, 48.5% living alone, 36.9% receiving formal home care) were referred by primary care physicians (76%), hospitalists (18%), or family members (7%). Main reasons for referral were request for comprehensive assessment, cognitive evaluation, and mobility assessment (45.2%, 26.2%, and 15.5%, respectively). 21.4% of patients are independent in Lawton's Instrumental ADL and 47.1% are independent in Katz's Basic ADL, and 57.3% of patients reported having fallen once or more over the last year. Overall, 76.2% of patients had gait and balance impairment, 72.8% cognitive impairment, 57.3% polypharmacy (≥6 drugs; median 6.5±3.9, IQR 4-8), 54.4% affective disorder, 48.3% osteoporosis, 45.1% urinary incontinence and 33.8% orthostatic hypotension. Polymorbidity (≥6 geriatric syndromes) was present in 58.3% of referred patients. On average, patients received 10.6±4.0 recommendations, including fall prevention interventions (85.2 % of patients: walking aid adaptation in 48.1%, vitamin D

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prescription in 59.7%, home hazards assessment in 59.2%, and exercise prescription in 53.4%), referral to a memory clinic (45.6%), and treatment modifications (69.9 % of all patients and 81.6% of patients with polypharmacy, mostly psychotropic drugs discontinuation).

Conclusions: Polymorbidity was frequent in these older outpatients, with polypharmacy, mobility and cognitive impairments being most prevalent. Outpatient geriatric consultation is a good opportunity to identify geriatric syndromes and propose interventions to prevent or delay functional decline.

Key words

Introduction

Aging of the population is putting the health care system under pressure. Maintaining the independence of older people and controlling their health services utilization will be a major challenge to contain healthcare expenditures in coming years[1]. Older persons frequently suffer from multiple geriatric conditions and disability that result in complex health care needs. Providing care to these multimorbid patients is especially complex. Clinical practice guidelines and best practices recommendations often focus on the management of a single disease rather than on the simultaneous care of several diseases in the same patient. They are therefore of little help to guide care and prevent functional decline in these patients[2, 3]. As a consequence, these patients often receive fragmented and incomplete care[4]. Moreover, primary care physicians facing this complexity often lack time to provide good care to this elderly population [5]. Numerous studies demonstrated the benefits from comprehensive geriatric assessment to prevent functional decline and reduce health services utilization[6], but most primary care physicians have not yet been trained and lack time to routinely perform such assessment in their busy practice.

On the other hand, geriatricians are trained to perform comprehensive geriatric assessment and are often organized in interdisciplinary teams (e.g. with nurses, physical therapist, occupational therapist, dietetician, social worker, chaplains, etc.). Geriatric teams are therefore better prepared to address the complex needs of elderly patients. However, geriatric resources are scarce and using these team as primary care providers might not be the most appropriate way to use the geriatric workforce[7]. New models of care are being developed, where geriatric teams support primary care physicians when facing these complex situations. For instance, clinical consultancy models have been successfully implemented in geriatric outpatient clinics. In these models, geriatricians serve as consultants or co-manager for the

primary care physician of elderly patients suffering from multiple diseases and requiring a high level of care coordination.

Although numerous medical centers have developed this type of service, surprisingly few data is available on reasons for patients' referrals and about characteristics of patients referred to these geriatric clinics[8]. Moreover, the diagnostic yield of these consultations is not well described, even though several previous studies have shown benefits in terms of identifying new conditions typically underdiagnosed in elderly patients (urinary incontinence, cognitive impairment, etc), as well as in preventing functional decline[9-12].

Similarly, information on process of care, such as details on specific types of recommendations addressed to primary care physicians after the consultation, have not been described in details before. A better knowledge of the contribution of geriatric consultations in bringing new knowledge to the primary care physician could enhance the targeting of older patients who might benefit most from such referral, and improve access to interventions aiming at functional decline prevention.

The objectives of this study were 1) to determine the characteristics of patients referred to a geriatric outpatient clinic; 2) to determine the prevalence of geriatric syndromes in this population; and 3) to identify the main recommendations provided to referring primary care physicians.

Methods

Population and setting

All community-dwelling patients aged 65 years or older referred to a geriatric outpatient clinic between April 2008 and March 2012, were included in the study. Launched in April 2008, this clinic is part of the ambulatory and community unit of the Service of Geriatric Medicine, University of Lausanne Medical Center, Lausanne, Switzerland. This clinic serves the elderly population of the city of Lausanne (about 60'000 people aged 65 years and over). The clinical aims of this outpatient clinic were a) to develop a home visit program for highly vulnerable homebound elderly patients, and b) to set up an outpatient clinic to assist primary care physicians in the care of their elderly patients. Within this model of consultancy, geriatricians perform comprehensive geriatric assessment for patients referred by primary care physicians for a one-time evaluation. This medical consultation, lasting about two hours, is performed by trained geriatricians, working in interdisciplinary team with nurses, physical therapist and occupational therapist. Patients are usually accompanied by a family member or a proxy, in order to collect reliable history. At the end of the medical encounter, a report summarizing clinical findings and related recommendations is sent to the primary care physician.

Data collection

Data were prospectively collected on reasons for referral, socio-demographics (age, gender, living situation, home care services use), functional (Katz's basic Activities of Daily Living[13], Lawton's instrumental ADL[14]), cognitive (Folstein's Mini Mental Status Exam[15], Clock Drawing Test[16], affective (Geriatric Depression Scale[17]), and mobility (Tinetti's Performance Oriented Mobility Assessment [18, 19]) status. Medical diagnoses, and new problems identified

at the consultation were systematically collected (i.e., gait & balance impairment, falls, cognitive impairment, affective disorders, behavioral disorders, delirium, polypharmacy, osteoporosis, urinary or fecal incontinence, sensory -visual or hearing- impairment, orthostatic hypotension, malnutrition, pain, sleeping disorders, social isolation, oral problems, skin problems). In addition, information on prescribed drugs, drugs category (i.e., psychotropic and hypnotic drugs, benzodiazepines) and inappropriate drugs according to Beers' criteria [20] were also systematically collected. Polypharmacy was defined as using six or more drugs.

Recommendations issued by the geriatric consultation were also collected and grouped into two principal categories according to the main provider in charge of implementation: a) the primary care physician (e.g. follow-up exam; investigations; treatment modifications); b) other healthcare providers (medical specialist; medico-social service provider as home care services; paramedics as physiotherapist, occupational-therapist, rehabilitation center, dietician).

The concordance between main reasons for referral mentioned by the primary care physician, and the diagnoses identified as well as related recommendations made at the consultation, were further investigated in four specific geriatric syndromes. For this analysis, aggregated recommendations clusters including all possible recommendations specific to each syndrome were constructed, since various recommendations are issued for each geriatric syndrome.

Statistical analysis

Data were analyzed using descriptive statistics. Comparisons between men and women and between patients with or without specific syndromes were tested using chi-square test for categorical variables (or Fisher's exact test if expected cell frequencies lower than 5), Mann-

Whitney U test for non-normal or ordinal variables and Student's t-test if normal distribution was assumed. Normality was tested using Shapiro-Wilk W test. Relations were considered significant at p<.05. Statistical analyses were performed using STATA 12.1.

Results

From April 2008 to March 2012, a total of 206 patients were referred to the geriatric outpatient clinic. Overall, 75% of the patients were referred by primary care physicians, 18% by hospitalists, and 7% by a family member, in the absence of a family physician. Request for a comprehensive geriatric assessment was the most frequent reason for consultation (45.2%), while requests to investigate specific geriatric conditions, such as cognitive or mobility impairments (26.2 and 15.5%), were much less frequent (Figure 1).

Characteristics of the population

Characteristics of referred patients are described in Table 1. The typical patient was an eighty year-old woman who lived alone without receiving formal home care services. Most were still independent in basic ADLs, but the majority already reported impairment in instrumental ADLs. Cognitive and affective impairments were present in about a third and a quarter of referred patients, respectively.

Comparisons across gender revealed that, compared to men, enrolled women were significantly older (80.8±6.8 years vs 78.2±8.3 years, P=.014), more likely to receive formal home care services (44.9% vs 26.1%, P=.006), to be cognitively impaired (35.9% vs 22.0% with MMSE score <24, P=.039), and to report depressive symptoms (mean GDS score 4.1±2.9 vs 3.2±3.3, P= .023).

Prevalence of geriatric conditions

Geriatric conditions identified in the study population are shown in Table 2. Overall, gait and cognitive impairments were present in about three quarters of referred patients. In addition, falls, polypharmacy, affective disorders, osteoporosis and continence problems were identified in about half of the patients.

Comparisons across gender showed that orthostatic hypotension and visual impairment were significantly more prevalent in men than women (42.4% vs 27.6%, P=.029; and 41.4% vs 27.1%, P=.032, respectively). Inversely, osteoporosis, malnutrition, and affective disorders were significantly more prevalent in women than men (55.9% vs 37.9% P=.011; 36.4% vs 23.0%, P=.001; and 64.4% vs 40.9%, P=.001, respectively).

Polymorbidity

On average, patients were diagnosed with 5.8±2.0 geriatric conditions, but a majority (N=120; 58.3%) had 6 or more geriatric conditions (defined as polymorbidity). Compared to the others, these patients had lower performance in basic as well as instrumental ADLs (4.9±1.2 vs 5.4±1.0, P<.001; and 4.1±2.8 vs 5.0±2.7, P=.018, respectively), and were therefore more likely to receive formal home care services (45.0% vs 25.6%, P=.004). Similarly, polymorbid patients were more impaired in gait and balance (POMA's score 20.9±4.7 vs 23.7±5.4, P<.001), cognitive (MMSE score 24.5±4.4 vs 25.4±4.9, P=.028), and affective (GDS score 4.3±3.2 vs 3.1±2.9, P=.013) functions.

Polypharmacy and prescribed drugs

Polypharmacy was defined as using six or more drugs. As shown in Table 3, the majority of patients received more than 6 drugs (mean 6.5±3.9). Comparisons among patients with and without specific geriatric syndromes revealed that polypharmacy was significantly more prevalent among patients with gait and balance impairment. Similarly, prescriptions of psychoactive drugs, as well as benzodiazepines -or other hypnotic drugs- were significantly more frequent in patients reporting one or more falls in the previous year. In contrast, receiving one or more inappropriate drugs (according to Beers' criteria[20]) was not associated with a higher prevalence of these geriatric syndromes.

Concordance between reasons for referral and geriatric conditions identified

Analysis investigating the concordance between reasons for referral and problems identified at the consultation showed that several highly prevalent geriatric syndromes were rarely mentioned as a reason for referral. For instance, incontinence was neither a reason for referral nor a problem mentioned on the physician list, although it was found in almost half (46.8%) the patients. Similar differences were observed for gait and balance impairment (76.2% diagnosed vs 14.6% referred for it), malnutrition (30.9% vs 2.9%), polypharmacy (57.3% vs1.5%), and cognitive impairment (72.8% vs 23.8%). Among patients referred for cognitive assessment, 90.7% were eventually confirmed with cognitive impairment, even though only 33.3% (N=18) had abnormal MMSE (defined as score <24).

Figure 2 shows the proportion of patients referred for four selected geriatric syndromes by the referring physician, in relationship with the proportion of patients a) diagnosed with these geriatric syndromes after the consultation; and b) receiving specific recommendations related to these syndromes. Overall, geriatric syndromes were diagnosed about twice more often than they appeared as reason for referral. Moreover, an additional 10 to 20% of the patients received specific recommendations for these geriatric syndromes, usually for primary prevention measures. Finally, less than 3% of patients referred for one of these specific geriatric syndromes were not diagnosed with it.

Recommendations issued from geriatric consultation

An average of 10.6±4.0 recommendations (median 10.5 [IQR 8.0;14.0]) per patient were made that necessitated interventions either from referring primary care physicians or from other health professionals (59.4% and 40.6% of all recommendations, respectively). The former included follow-up examinations (17.1%), further investigations (10.7%) or treatment modifications (31.6%); the latter included referral to other medical specialists for an

assessment or a follow-up (14.2%), organization of medico-social service providers such as formal home care services or volunteers (10.7%), other health care professionals such as physical or occupational therapist, rehabilitation center or dietician (15.8%).

Among all patients, 32.7% were referred for cognitive problems, 72.8% were diagnosed with cognitive impairment and 88.1% patients received corresponding recommendations. Most frequent cognition-related recommendations were a follow-up screening with MMSE by the primary care physician (N = 137, 66.5% of all patients), memory clinic referral (45.6%), and drug treatment modification (usually psychotropic and/or benzodiazepines, 44.7%).

Gait and balance impairment was mentioned in 19.1% of all referred patients, diagnosed in 76.2%, and lead to specific recommendations in 85.2%. Only 1.0% of patients referred for this reason were not diagnosed with this syndrome. Most frequent recommendations were vitamin D substitution (59.7% of all referred patients), referral for occupational or for physical therapy (59.2% and 53.4%, respectively), and walking-aids adaptation (48.1%).

Among patients with polypharmacy, a recommendation for treatment modification was made in 81.6% (N = 93) of the patients (56.2% psychotropic treatment modification and 19.4% for analgesic treatment modification).

Although only 8.0% of all patients were referred for possible affective disorders, it was diagnosed in 54.4%, and lead to recommendations in 71.3%. Only 1.9% of patients referred for this reason were not confirmed to suffer from it after the consultation. Follow-up by primary care physician (40.3% of all patients), treatment modification (44.7%), and referral to psychiatric specialized care (24.3%) were the most frequent recommendations.

Finally, whereas malnutrition was mentioned at referral in only 9.5% of all patients, this diagnosis was established in 30.7% of all patients, and lead to specific recommendations in 39.6%. These were mostly for weight monitoring (29.6%of all patients).

Discussion

This study provides original information regarding characteristics of community-dwelling elderly patients referred by their primary care physicians to a geriatric outpatient clinic. These patients had a high prevalence of multiple geriatric conditions (58.3% with 6 or more geriatric conditions), even though they remain mostly independent in their basic activities of daily. In particular, gait and cognitive impairments, as well as polypharmacy, were highly prevalent in this population. Nevertheless, these geriatric conditions were rarely mentioned as the reason for referral, and primary care physicians most often referred patients for comprehensive geriatric assessment, rather than for investigation of a specific geriatric condition. In contrast, when primary care physician referred a patient for a specific problem (e.g. cognitive impairment), this problem was almost always confirmed at the end of the consultation. Overall, these findings suggest a high specificity of the clinical judgment of these primary care physicians when identifying a geriatric syndrome. In contrast, the discordance between the prevalence of diagnosed syndromes observed at the consultation, and their mention by referring physicians, suggests that sensitivity of this judgment (ranging from about 11% for malnutrition and affective disorders to about 36% for cognitive impairment) could be improved. Even though referring physicians were not specifically asked to mention all suspected geriatric syndromes, estimated sensitivities were far below one would expect. Interestingly, sensitivity to identify several of these geriatric syndromes estimated from this study are very similar to those found in previous studies performed in the same healthcare environment[21, 22]. These results further emphasize the need to better train future primary care physicians to improve identification of frequent geriatric syndromes.

This study also highlights the high number of recommendations made by geriatricians, from which about half required a direct intervention from the primary care physician, and a third concerned treatment modifications.

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Overall, results of this study support the hypothesized interest of this model of geriatric consultancy and suggest several potential benefits. First, from the patient perspective, this consultation allows the identification of geriatric conditions and results in recommendations to introduce preventative measures that have been shown to delay functional decline[12]. Future studies will be needed to investigate the implementation and the impact of such measures in this specific healthcare environment.

Second, from the primary care physician perspective, this consultation and the geriatric assessment provide comprehensive information about patients frequently considered as "very complex" because they suffer from intricate medical, functional, cognitive, affective and social problems. Results from this geriatric consultation should help physicians to better differentiate some problems (e.g., disentangling in a patient the respective contributions of cognitive, affective, social, and economic problems to malnutrition) and prioritize therapeutic options. As a consequence, the goals of care might be clarified, along with the patient and his or her family.

Third, from a public health perspective, this consultation offers a new opportunity to improve care of highly vulnerable patients and to contribute in preventing future burden of the healthcare system related to functional decline epidemics. Moreover, some of these patients require large amount of time from the primary care physician to care for them. Unfortunately, such care are neither well reimbursed, nor recognized as a contribution to the entire healthcare system. Geriatric outpatient consultations might therefore support primary care physicians in lowering charge for time-consuming consultations. Finally, these consultations might further serve for identifying patients most in need of highly integrated care that combine healthcare and social interventions.

This study has some limitations. First, it was performed in a specific healthcare environment. Generalizability to other environment must be cautious. This study included patients seen

shortly after launching the consultation. Its specific role in the community and the healthcare system was not yet precisely defined, and characteristics of referred patients might change over time. Second, the effectiveness of this consultation in its specific healthcare environment is not yet proven. It is unknown which proportion of recommendations issued by geriatricians have been eventually implemented by the primary care physicians. Some of the recommendations, especially those necessitating motivational interviews (e.g. encouraging a refractory patient to use a walking aid, discussing advance directives...), are complex to implement. The next step would be to support primary care physicians in implementing these recommendations. A third limitation is the lack of precise data from the primary care physician, and especially a precise list of diagnosis (real world picture). This lack of data precludes any firm conclusion about the proportion of geriatric conditions newly identified.

This observational study highlights the potential benefits, as well as the limits, of implementing a geriatric outpatient clinic. This study was conceived as a first quality assessment, in order to further adapt and develop this model of geriatric consultancy. Even though it was performed in a specific healthcare environment, results highlight some important aspects to consider by geriatricians aiming at developing similar consultations. Future studies will be needed to track the implementations of recommendations issued by geriatricians and to document benefits for the patients.

Acknowledgements

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Tables and figures

Table 1: Socio-demographic and functional characteristics of the study population

Characteristics	(N=206)		
Age	Mean ± SD	79.7	± 7.6
Women	n (%)	118	(57.3)
Swiss citizenship	n (%)	147	(71.4)
French speakers	n (%)	187	(90.8)
Living alone	n (%)	100	(48.5)
Receiving home care	n (%)	76	(36.9)
POMA Score[1]	Mean ± SD	22.1	± 5.2
	p50 [IQR]	23.0	[19.0 ; 26.0]
Basic ADL[2]	Mean ± SD	5.1	± 1.2
	p50 [IQR]	5.0	[5.0; 6;0]
Instrumental ADL[3]	Mean ± SD	4.5	± 2.8
	p50 [IQR]	5.0	[2.0; 7;0]
MMSE Score[4]	Mean ± SD	24.9	± 4.7
	p50 [IQR]	26.0	[22.0; 28.0]
Cognitive impairment[5]	n (%)	55	(29.7)
Abnormal Clock-drawing test [6]	n (%)	81	(47.4)
GDS Score[7]	Mean ± SD	3.8	± 3.1
	p50 [IQR]	3.0	[1.0 ; 5.0]
GDS Score ≥ 6	n (%)	36.0	(23.8)

[1] Tinetti's Performance Oriented Mobility Assessment[19] : score from 0 to 28, higher score indicating higher gait and balance performance ; 11 missing

[2] Katz's basic ADL[13] : score from 0 to 6, higher score indicating better functional status ; 3 missing

[3] Lawton's instrumental ADL[14] : score from 0 to 8, higher score indicating greater independence ; 3 missing

[4] Folstein's Mini Mental State Examination[15] : score from 0 to 30, higher score indicating better cognitive function, 21 missing

[5] Defined as MMSE score < 24

[6] 35 missing

[7] Yesavage's Geriatric Depression Scale [17]: score from 0 to 15, higher scores indicating higher depressive symptoms, 55 missing

Table 2: Prevalence of geriatric conditions identified in the study population (N=206)

Geriatric conditions identified	%
Gait & Balance impairment	76.2
Cognitive impairment	72.8
Falls	57.3
Polypharmacy	57.3
Affective disorders	54.4
Osteoporosis[2]	48.3
Urinary or fecal incontinence[2]**	46.8
Sensorial (visual or hearing) impairment[2] *	44.9
Orthostatic hypotension[1]	33.8
Undernutrition[2]	30.7
Pain***	13.2
Sleeping disorders[2]	10.7
Behavioral disorders[1]	9.3
Social isolation	9.2
Delirium [2]	8.3
Oro-dental problems[2]	3.4
Skin problems[2]	1.0

*73.9% of whom have visual impairment, 63.0% have hearing impairment and 36.9% have visual and hearing impairment

** 96.9% of whom have urinary incontinence, 6.3% have fecal incontinence and 3.3% have urinary and fecal incontinence

[1] 5 missing values

[2] 1 missing value

Table 3: Prevalence of polypharmacy, number and type of prescribed drugs according to the presence of 3 geriatric syndromes (cognitive impairment, self-reported fall(s), and gait and balance problems).

Characteristics		*All patients*	Patients with cognitive impairment ?			Patients reporting one or more falls ?			Patients with gait and balance impairment ?		
			Yes	**No**	*p*	**Yes**	**No**	*p*	**Yes**	**No**	*p*
		(N=206)	*(N=150)*	*(N=56)*		*(N=118)*	*(N=88)*		*(N=157)*	*(N=49)*	
Polypharmacy [1]	*(%)*	57.3	54.7	64.3	.214	60.2	53.4	.332	63.1	38.8	.003
Number of prescribed drugs	*Mean ±SD*	6.5 ± 3.9	6.1 ± 3.6	7.5 ± 4.5	*.068*	6.9 ± 3.9	5.9 ± 3.9	*.103*	6.9 ± 3.9	5.1 ± 3.9	*.001*
	p50 [IQR]	6.0 [4.0;8.0]	6.0 [3.0;8.0]	7.0 [4.0;10.0]		7.0 [4.0;9.0]	6.0 [3.0;8.0]		7.0 [5.0;9.0]	5.0 [3.0;6.0]	
Psychoactive drug[3]	*(%)*	55.9	56.7	53.7	.707	64.1	44.8	.006	59.4	44.9	.076
Benzodiazepine & hypnotic[4]	*(%)*	35.6	34.7	38.2	.641	41.9	27.3	.031	36.5	32.7	.620
Inappropriate drugs[5]	*(%)*	26.8	28.7	21.8	.327	29.9	22.7	.250	29.5	18.4	.125

[1] Geriatric syndrome of polypharmacy is defined by a number of six or more drugs prescribed to the patient, except eye drop.
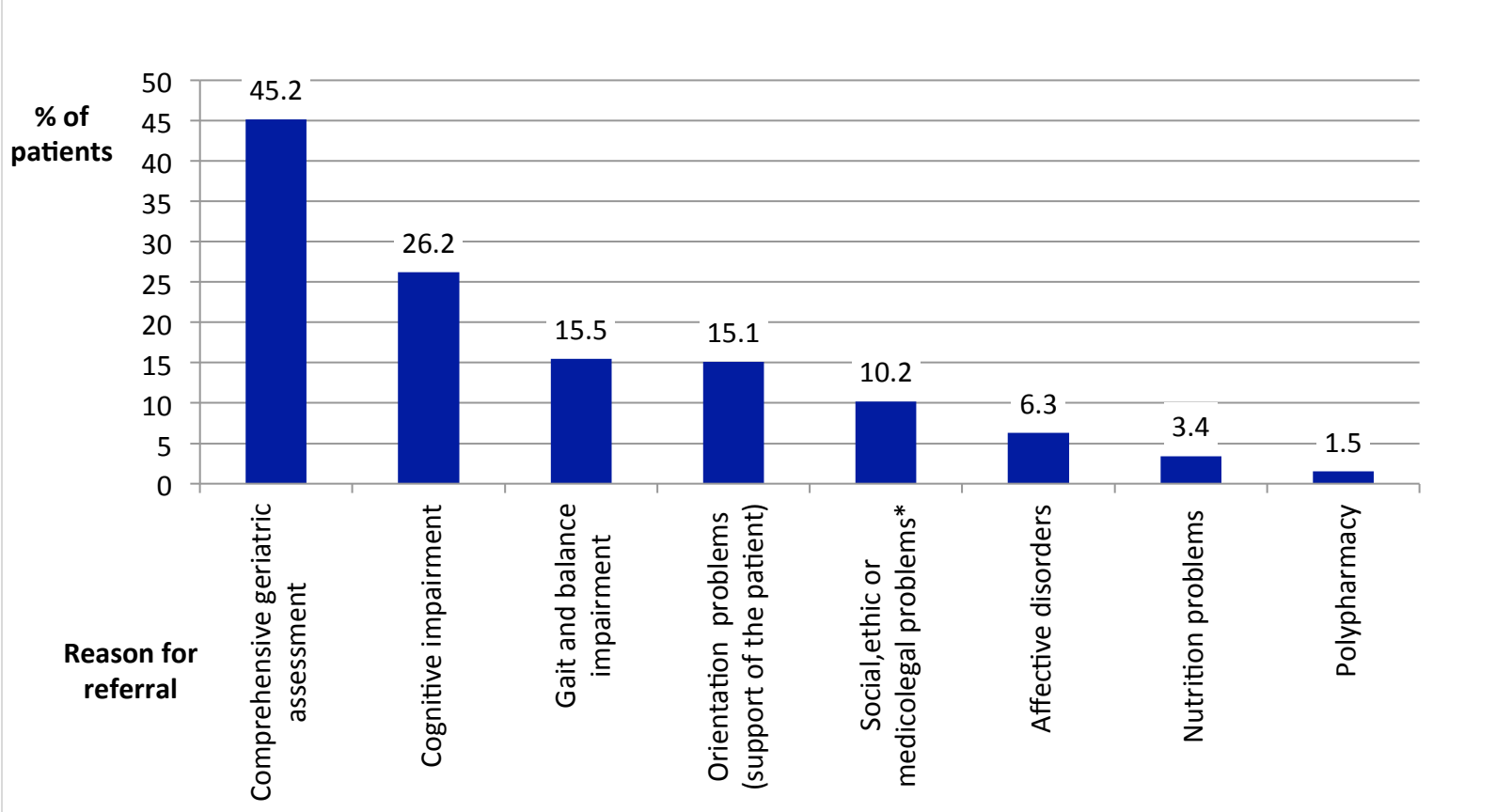[2] Significant difference (with p-value < 0.05)
[3] 2 missing values
[4] 1 missing value
[5] The inappropriates drugs are defined according to Beer's revised criteria[20, 23]

**Figure 1:** Proportion of patients by main reasons for referral

(N = 206)

One or more reason is possible

* 1 missing value

Figure 2: Proportion of patients in the study population (N=206) referred for four specific geriatric syndromes and corresponding proportions of patients diagnosed with the syndrome and receiving recommendations for this syndrome after the geriatric consultation.
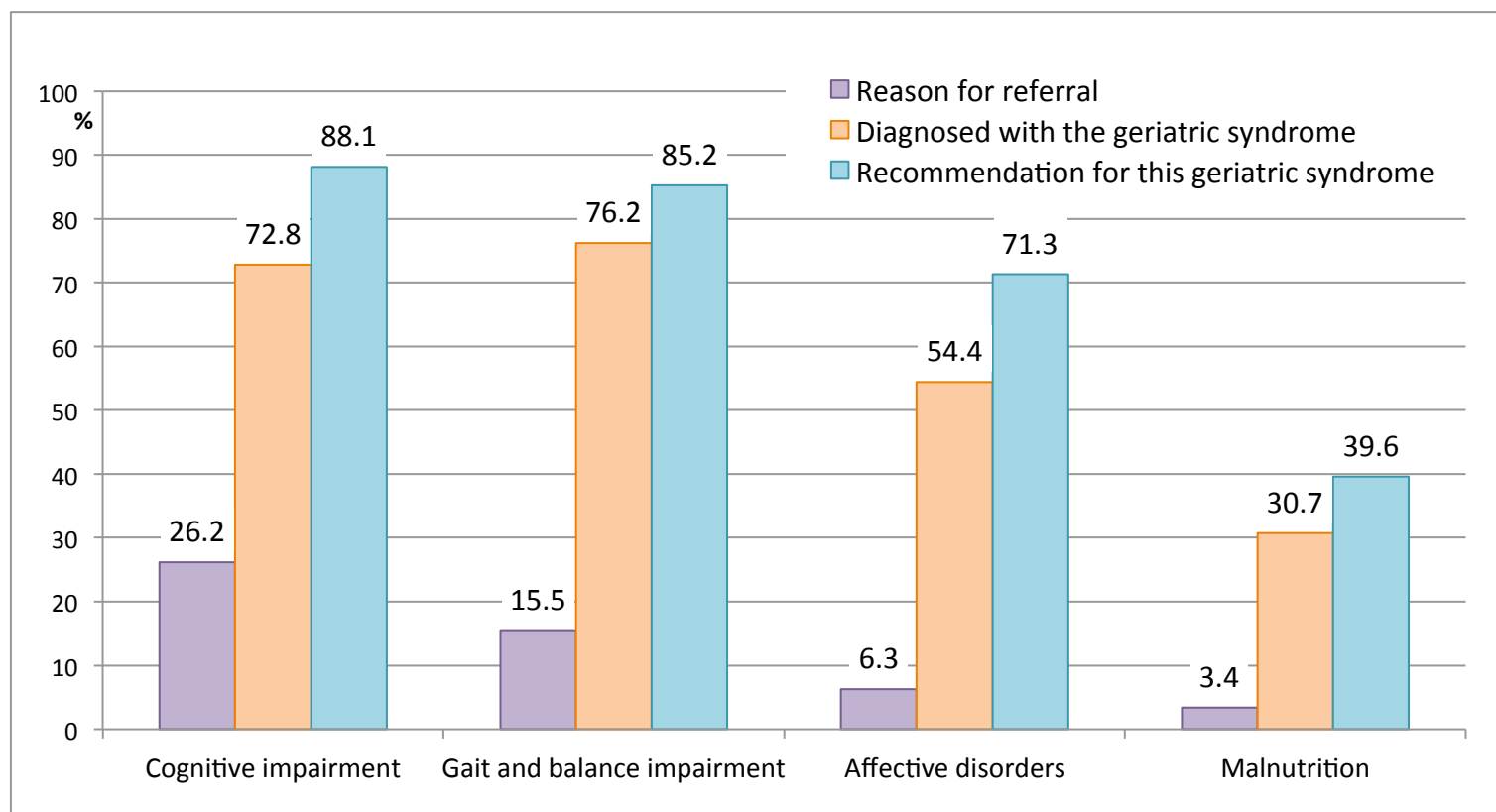
- 1 missing value for diagnostic of malnutrition (N=205)
- 4 missing values for the recommendations (N=202)