

Impaired Mobility in Older Persons Attending a Geriatric Assessment Clinic: Causes and Management

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ABSTRACT

Objectives: To study the profile of older persons with impaired mobility.

Methods: A retrospective observational study that reviewed the case records of patients with impaired mobility at a geriatric assessment clinic. Data on mobility status, duration of decline in mobility, functional status, causes, intervention and short-term outcome (up to 16 weeks) were extracted and analysed.

Results: The study included 78 patients (42 males) with the median age of 78 years (61 to 96). About 80% had independent pre-morbid mobility. At presentation, this declined to 45%. Delayed consultations (more than 2 years) were found in 17% of patients. One third had associated decline in transfer, dressing, toileting or bathing, while 19% also had decline in feeding. In each patient, cause(s), many which were potentially reversible, were identified to have contributed to the immobility. More than one cause was identified in half of the patients. Interventions were prescribed in 88% of these patients. Short-term follow-up (median 7 weeks) showed that 21 had an improvement, 35 had the same and 8 had decline in mobility. There was a significant trend towards better outcome when patient presented early during their course of decline in mobility ($p=0.005$, linear by linear association = 0.013).

Conclusion: Impaired mobility is a common pathway for many diseases, and is associated with significant functional decline. With proper evaluation, the offending causes can be identified. Early consultation is important for the application of appropriate intervention and can result in better outcome.

Keywords: aged, elderly, geriatric syndrome, geriatric assessment, intervention

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INTRODUCTION

Aging results in reduced physiological reserve, which increases vulnerability to diseases and impairments. Geriatric syndromes, such as impaired cognition, incontinence, instability, falls, and impaired immobility, are multifactorial health conditions that occur when the accumulated effect of impairments in multiple systems render a person vulnerable to situational changes⁽¹⁻³⁾. Unfortunately geriatric syndromes are commonly mistaken as consequences of normal aging, resulting in delayed evaluation and intervention for the underlying aetiologies, many of which can be reversible if detected early. It has been shown that appropriate intervention can significantly benefit patients with geriatric syndromes resulting in reduced mortality and hospital admissions, improved physical and cognitive function and increased likelihood of living in the community (as opposed to institutionalization)⁽⁴⁻¹⁰⁾.

Impaired mobility is one of the most misunderstood, yet highly prevalent geriatric syndromes⁽¹¹⁾. Insufficient clinical appreciation and detection of this syndrome can lead to deleterious consequences from the disability^(12,13). Hence, we sought to examine the profile of a cohort of older persons with impaired mobility presenting at a tertiary care setting. Particular focus was given to the contributing causes of the impaired mobility as well as the interventions that were applied to the patients. The ultimate goal is to determine the extent to which the causes of this geriatric syndrome are treatable.

METHODS

a) Design

Older patients attending the Geriatric Assessment Clinic (GAC) at Tan Tock Seng Hospital were evaluated with special emphasis on the presence of the major geriatric syndromes (falls, impaired immobility, incontinence, impaired cognition). Where appropriate, blood investigations, imaging studies (including CT scan of the brain) and standard tests (such as electrocardiograms) were performed. Appropriate interventions were also implemented in this Clinic.

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The study design was retrospective and observational based on the cohort of patients attending the GAC from May to October 1998. During this study period, all clinic patients were assessed by geriatricians using a standard protocol. Patients who had impaired mobility at presentation were included in the study. The definition of impairment in mobility included (1) patients who required supervision or assistance mobility, (2) those who were chairbound or bedbound, as well as (3) those, while still independent in mobility, who experienced unsteadiness in gait or difficulty in walking.

b) Assessment

Data was extracted from the case records of these patients. The structured clinical protocol regularly recorded the functional status of all the attending patients, details of the mobility status, the duration of decline in mobility, as well as the activities of basic living (BADL) status. The causes contributing to the impaired mobility were also recorded. Any intervention applied was classified as major, minor (as defined in Table I) or no intervention.

c) Outcome

Mobility status was reassessed after short-term follow-up (up to 4 months). Based on patients' (or caregivers') subjective description and the physicians' assessment, patients' mobility status were categorised as either (1) improved, (2) no change, or (3) declined.

STATISTICS

Descriptive statistical analysis was the major statistical tool in this study. Chi square test was used to analyse the relationship between duration of impaired mobility, and the outcome of the mobility status. Statistical Package for Social Sciences (SPSS version 8) was used to sort the data and carry out the above analyses.

RESULTS

Of the 154 patients who attended the GAC during the study period, 78 (50%) had the problem of impaired mobility. There were 42 male and 36 female, with the age ranging from 61 to 96 (mean 78.3, median 78). The proportion of Chinese was 87.2% while that of Malays was 6.4% and Indians was 6.4%. Compared with the population census in 1995 (79.5%, 11.5% and 77% respectively⁽¹⁴⁾), the Chinese were over represented while the Malays were underrepresented. Majority of subjects were from the community (79.5%), while the remaining were referred from institutions.

Mobility

Impaired mobility was the presenting complaint in 2/3 (53 out of 78; 67.9%) of the patients. For the remaining

Table I. Types of intervention implemented on patients with decline in mobility.

Category	Type of intervention	Number	%
Major intervention	New medication prescribed	34	43.6
	Existing medication removed	10	12.8
	Referral to physiotherapist and/or occupational therapist for assessment and intervention	12	15.4
	Risk assessment and modification (e.g. cerebrovascular and/or cardiovascular risks)	10	12.8
	Referral for surgical intervention	5	6.4
	Admission for inpatient management	13	16.7
	Referral for medical intervention	39	50.0
Minor intervention	Medication dose adjustment	7	9.0
	Counseling and education	5	6.4

third (32.1%), impaired mobility was identified as one of the problems after assessment. Less than half (35 patients, 45%) could ambulate independently at presentation. Fifteen (19%) required supervision in ambulation, 14 (18%) required assistance, and the last 14 (18%) were chair bound or bed bound.

While the majority of patients presented within 2 years of decline in mobility (15 [19%] within the first month, 28 [36%] between 1 to 6 months, 22 [28%] between 6 months to 2 years), almost a fifth (13 patients, 17%) did so after 2 years.

ADL

More than half (55%) of the patients with impaired mobility had associated decline in at least one BADL, with nearly a third (31%) had four or more BADL declines (13%, 5%, 6%, 19% and 12% had decline in one, two, three, four and all five BADLs, respectively). Under each category of BADL, transfer, dressing, toileting or bathing were equally affected (35%, 34%, 31% and 36% respectively), while decline in self-feeding was found in 19%.

Causes contributing to decline in mobility

Table II illustrates the causes contributing to the decline in mobility. All patients had at least one disease condition causing the decline in mobility. Predominant causes were neurological and musculoskeletal impairments. Half of the patients had two or more causes that contributed to the decline (49% had only one cause, 33% two causes, 13% three causes, 4% four causes).

Interventions

Major interventions were implemented in 53 (67.9%) patients and while 16 (20.5%) had minor intervention only. Only 3 (3.8%) patients were assessed as to be not requiring further intervention. Six (7.7%) patients

Table II. Causes contributing to decline in mobility.

Classification	Detail	Number	%
Neurological	Stroke / Multi-infarct Disease	50	64.1
	Parkinsonism	11	14.1
	Alzheimer's disease	7	9.0
	Peripheral neuropathy	7	9.0
	Spinal cord lesions	6	7.7
	Other CNS diseases*	3	3.8
Musculoskeletal	Arthritis	11	14.1
	Fracture of the neck of femur	1	1.3
	Other musculoskeletal diseases**	4	5.1
Others	Decrease in vision	9	11.5
	Sepsis	5	6.4
	Postural hypotension	5	6.4
	Depression	3	3.8
	Deconditioning	3	3.8
	Drug-induced	2	2.6
	Non-specific giddiness	2	2.6
	Other medical causes***	6	7.7

* Other CNS diseases include meningioma and subdural hematoma

** Other musculoskeletal diseases include right hip operation, feet callosities, limb length discrepancy and severe kyphosis

*** Other medical causes include IHD, peripheral vascular disease, seizure, chronic lung disease and liver carcinoma

Table III. Cross tabulation of duration of decline in mobility at presentation with the outcome at 4 month.

Mobility	Duration of decline in mobility at presentation			Total
	Less than 6 months	6 months to 2 years	More than 2 years	
Improved	18	1	2	21
Same or declined	15	16	5	36
Total	33	17	7	57

P value (Pearson Chi Square) = 0.003

P value (linear-by-linear association) = 0.013

defaulted follow-up before decision of intervention was made. Table I provides a breakdown of the intervention applied on the patients.

Outcome

The median follow-up period for the study population was seven weeks (mean 6.7 weeks; range 1 to 16 weeks). Eleven patients (14.6%) defaulted follow up. Three patients did not receive any intervention. Of the remaining, 21 (28%) showed improvement in mobility, 8 (10.7%) had declined in mobility, and 35 (46.7%) did not experience any change in mobility.

When the outcome was analysed with the duration of decline in mobility at presentation, there was a significant trend in better outcome when the patient presented earlier in the course of the decline (Table III, $p=0.05$, linear-by-linear association= 0.013).

Other major geriatric syndromes

Sixty-five patients (87%) had at least one additional geriatric syndrome: 32 (42%) of them had two

syndromes, 23 (31%) had three, and 11 (14%) had all four major geriatric syndromes. Confusion was found in 38% of patients, falls in 38% and incontinence in 35% of patients.

DISCUSSION

Impaired mobility, like other geriatric syndromes, is a common pathway by which a host of diseases in older individuals produce functional disability. While not all of the causes may be preventable, many of the adverse effects of immobility can potentially be. Furthermore, improvement in mobility is possible in many instances, especially if the underlying aetiologies are arrested early.

Impairment in mobility in older persons is by no means a rare entity. In a recent cross-sectional study of 3351 community-dwelling Danish individuals 75 and above, Anderson et al found that 20.7% of them were unable to walk indoors independently, and mobility gradually decreased with increasing age, with the lowest levels amongst the 100-year-olds⁽¹¹⁾. Similarly, a community-based survey in Singapore showed that immobility and physical dependence increased from 2.4% among those aged 55 to 64 years, to 11.3% for those aged 75 years and above⁽¹⁴⁾.

In our study, only two-thirds of the patients with impaired mobility came to us for the problem; for the remaining third, the impairment in mobility was an incidental finding. This observation could be due to (1) the misconception that immobility is part of normal aging process; (2) the prevailing culture of our major ethnic groups that tend to value rest inactivity as a privilege of older members of our society; (3) the misconception that prolonged bed rest is always a therapeutic measure for older adults who are ill. All these factors combine to result in delay in seeking medical help when the older person suffers from impaired mobility, as seen in our study: only slightly more than half (54.6%) of our patients sought medical attention within 6 months of their decline in mobility, 16.9% presented only after 2 years of decline.

Impairment in mobility has great impact on mortality⁽¹⁵⁾, morbidity⁽¹²⁾ and functional capacity⁽¹¹⁾ of older persons. About one-third of our patients had associated declines for all BADLs except self-feeding, which was impaired in about 20%. This would translate to an enormous socio-economical burden in the care of these patients, especially when impaired mobility was closely associated with the other geriatric syndromes: 78% of our patients had more than one syndrome concurrently.

The various causes of decline in mobility identified in our study clearly illustrate some of the principles of

geriatric medicine. Firstly, all patients had at least one cause of impaired mobility. In other words, impaired mobility (and other geriatric syndromes) is due to disease and not aging. Secondly, disease manifestation can be atypical. In our study, some patients with, for example, pneumonias or urinary tract infection did not present with organ-specific complaints but functional decline (impaired mobility). Thirdly, multiple diseases often co-exist in the same patient with no single disease necessarily dominating the clinical picture and hence defying the traditional medical concept that a single disease can account for all abnormal findings. We found that 51% of our patients had two or more diseases contributing to the impaired mobility. For those with multiple etiologies, it was not often possible to pinpoint the main culprit causing the impairment. Finally, many of the conditions causing geriatric syndromes were potentially reversible. In our study, many causes, especially those under the category of 'others' (Table II), such as sepsis and fracture neck of femur, were easily reversible. Even if the underlying cause is not reversible, as for example, Parkinson disease and stroke, treatment can still be instituted to optimise function, to arrest disease progression, or to prevent complications arising from immobility. In our study, 68% of the patients had at least one form of major intervention, with another 20% who received minor interventions.

Previously published data had demonstrated that appropriate interventions for patients with geriatric syndromes have resulted in favorable outcomes in both hospital⁽⁴⁾ and community⁽¹⁰⁾. However, none of the studies were designed specifically for intervention of immobility per se. Our study looked at the short-term outcome of the intervention, up to a follow-up period of 4 months. No active intervention was offered in 4% of our patients. This was more likely for patients who presented more than two years after the onset of decline in mobility. This group of patients represents the category where active intervention was unlikely to confer any benefit in the opinion of the attending geriatrician. Amongst those who received intervention and continued on follow-up during the study period, we demonstrated that with earlier presentation during the course of impaired mobility, the better the short-term outcome with regards to mobility.

We are aware of the various limitations of this study design. Firstly, there is no control population to be compared with. However, having a control population is hard to justify as we think that it would be unethical not to intervene if impaired mobility was identified, especially if potentially reversible causes were found. Secondly, one can argue that improvement could be related to natural progression of the diseases,

such as a self-limiting illness that would resolve even without intervention. When we looked at the detail of illnesses in each patient, we found only one potentially self limiting illness within the study population - a patient who suffered from deconditioning from severe viral upper respiratory tract infection. All other cases were either potentially progressive (for example stroke diseases) or dangerous (for example sepsis) if left alone. Lastly, the outcome assessments were not blinded. Despite these limitations, our data suggests that early consultation for older persons with impaired mobility is important: The later the consultation, the less likely it is that intervention can be instituted, and the outcome is likely to be worse.

CONCLUSIONS

Impaired mobility, like other geriatric syndromes, is a common pathway for many diseases in older persons. It can result in significant disability and functional decline. It is caused by definable disease conditions. More than one cause is implicated in half of the cases. In almost 90% of our study patients, appropriate intervention was applicable. As the probability of intervention and improvement is higher with patients presenting earlier in the course of the decline in mobility, early detection of the problem is important. Impaired mobility should not be attributed to the process of normal aging when it occurs in older persons. Instead, comprehensive evaluation is indicated to identify the underlying cause(s) for the impaired mobility as well as any other functional declines. This facilitates specific management of these causes as well as guides efforts at rehabilitation to reverse the impaired mobility or optimise residual function.

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