PRIVATE NURSING HOME RESIDENTS IN HONG KONG - HOW FRAIL ARE THEY AND THEIR NEED FOR HOSPITAL SERVICES

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Summary
We studied the profile and hospital utilization rate of 933 residents from a random sample of private nursing homes in the Hong Kong East region. Most PNH residents were sufferers of chronic medical illness. 30% is either bed or chairbound while 50-70% is dependent in various modalities of basic activities of daily living. 40% is incontinent, either bowel or bladder. Use of restraints is about 13% whereas use of Ryles’ tube is about 3.5%. Presence of bedsore is about 7.1%. Hospitalization rate is about 50% over six months’ period and attendance at Specialist Out-patient Clinic is about 60%. Old age, increase in number of medical diagnosis and medications, dependency in toileting, presence of Ryles’ tube or bedsore and need for SOPD follow up in past six months are associated with increased rate of hospitalizations. We propose that there is a need of community geriatrics support to these frail elderly.

Keywords: elderly, nursing homes, community geriatrics services

Introduction:
The population of Hong Kong has reached 6.3 million by year 1996. Elderly above 65 years old account for 10% of population. The percentage of elderly above 65 years old is expected to rise to 11.7% by 2001. While Social Welfare Department / non-government organizations (NGOs) provide 18,587 places of institutionalized care for elderly by 1998-1999 (including 1,800 in private nursing homes under bought place placement scheme)2, there is a great demand for more placement. Waiting time for Care and Attention home (C&A home) is about 36 months whereas for infirmary is about 26 months. Currently, there are about 572 private nursing homes (PNH) in Hong Kong with 28,000 residents. It is usually felt that those living in PNH are frailer and that they attend Accident and Emergency department (A&E) often and hospitalized frequently. However, no study has been done previously to document the profile of the PNH residents in terms of medical, functional, nursing care dependency and their rate of utilization of hospital and outpatient services.

Community Geriatrics Assessment Teams (CGAT) were formed under the Hospital Authority since 1994 to support elderly residing in Care and Attention Homes (C&A Homes). Residents of C&A Home require supervisory level of care. CGATs were formed to provide medical and rehabilitative support to C&A Homes. In 1997, CGAT team began to introduce pilot service to PNH. However, profiles of PNH residents is lacking which are of importance in planning and organizing of service structure.

The primary objective of this study is to assess the medical, functional, nursing care dependency and pattern of utilization of hospital services of PNH residents in Hong Kong East Region. The secondary objective is to analyze the factors associated with frequent utilization of hospital admissions.

Methods
Study population
Between July - December 1997, out of 55 (total of 2058 residents) PNHs in Hong Kong East region,
we randomly recruited 16 private nursing homes of various sizes (10-173 places/home) from representative geographical regions of Hong Kong East region (Wanchai, Causeway Bay, North Point, Shaukeiwan and Chaiwan respectively) for our study. All residents from these randomly selected homes (933 in total) were recruited. The residents recruited constitute about 45% of all PNH residents in Hong Kong East region.

Assessment of residents

Three nurses of community geriatric assessment team (CGAT) of the Department of Geriatrics, Ruttonjee Hospital performed assessment of 933 residents in person at PNH. Areas assessed included medical, functional and nursing care dependency.

Medical history and diagnosis were obtained by going through medical records and interview with residents. Records of hospital admissions and attendance at specialist out patient department (SOPD) in past six months were obtained retrospectively by asking residents, going through records/appointment sheet and discharge summary written by doctors kept at PNH. Medications taken by residents were inspected, counted and names recorded.

For functional status, performance of residents on the day of interview was taken as the recorded status. Mobility status were classified in 4 grades as independent, require aids, chair-bound or bed-bound. Activities of daily living (ADL) were classified in 4 grades as independent, require mild assistance, require moderate assistance or totally dependent. Altogether 7 modalities of ADL were included, namely feeding, transfer, toileting, grooming, dressing, stairs and bathing.

Nursing care dependency was specifically assessed in certain areas. Orientation to time, place, person were assessed in person on day of interview. Those that were oriented in three aspects were regarded as normal. Bowel and bladder continence status was recorded. Incontinence was considered if resident has uncontrolled leakage of urine or faeces, regardless of amount, for more than two times per week. Use of Ryles’ tube, Foley, restrainer, presence of bedsores or contractures were all noted during interview and assessment. Physical restraint was defined as use of ankle or wrist cuffs, belts and vests noted on the day of interview.

Statistical analysis

Descriptive data on 933 PNH residents were given. Patterns of utilization of hospital services were analyzed. Linear logistic regression model with presence of hospital admission in past six months as dependent variable and sex, age, number of diagnosis, no of medications, presence of bedsores, use of Ryles’ tube, number of SOPD follow up, mobility and seven aspects of activities of daily living as independent variables were used to assess the prediction of these factors on hospital admissions. All statistical analysis were done using SPSS software.

Results

1) Demographic characteristics

Among 933 PNH residents, 662 (71%) are female while 271 (29%) are male. 884 (94.8%) are above 65 years old. Mean age is 80.4 (±9) years.

2) Medical profile

Chronic medical illnesses comprise the vast majority of medical problems. The ten most common medical diagnoses in order of descending frequency are cerebrovascular accident (28.8%), hypertension (28%), ischaemic heart disease or congestive heart failure (19.6%), dementia (17.3%), diabetes mellitus (17%), fractures of all sorts (15.4%), chronic obstructive airway disease (9.9%), parkinsonism (7.6%), peptic ulcer (5.3%) and malignancy of all sorts (5.3%). (Figure 1). Average number of diagnosis is 2.2/ residents.

As for the use of medications, mean number of medications per resident is 4.7. About 20% of residents have polypharmamacy with medications ≥5 in number. Only 23% of residents do not take any medications (Figure 2). As a comparison, nursing home residents in US receives 7.2 medications / resident3.

3) Functional profile

Only 31% of residents are fully independent. 38% require walking aids, 24% are chair-bound...
while 7% are completely bed-bound. Concerning 7 domains (bathing, stairs, dressing, toileting, grooming, transfer and feeding) of activities of daily living (ADL), 21.1 - 57.3% of residents are totally dependent, with dependency greatest for bathing, followed by stairs, transfer, toileting, grooming, dressing and feeding (Figure 3).

4) Nursing care dependency

One third of residents are found to have impairment of orientation. Bowel and urinary incontinence is common, comprising 41.5% and 41.7% of residents respectively. Use of Ryles’ tube and Foley catheter is 3.5% and 1.7% respectively. Use of restrainer is about 13.3%. Presence of bedsores is 7.1%.

5) Pattern of utilizing hospital services in past six months (Figure 4)

50% of residents have attended at least once or more to Accident or Emergency Department / emergency hospitalizations in past six months. 57% and 23% have attended Specialist Out Patient Department and Government Out Patient Department (GOPD) respectively at least once in past six months.

6) Factors associated with increased hospitalizations and specialty out patient service (Table 1)

Using stepwise linear regression, seven factors are associated with hospitalizations as listed below. Apart from toileting, all other aspects of ADL are not associated with hospitalizations. And neither do mobility status had effect on hospitalizations.

Table 1: Factors influencing hospitalizations of PNH residents

<table>
<thead>
<tr>
<th>OR (95% CI)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Old age (&gt; 70 years)</td>
<td>1.72 (1.11-2.66)</td>
</tr>
<tr>
<td>Number of medical diagnosis (&gt; 3 medical diagnosis)</td>
<td>2.23 (1.53-3.25)</td>
</tr>
<tr>
<td>Number of medications (≥ 5 medications)</td>
<td>1.74 (1.25-2.48)</td>
</tr>
<tr>
<td>Presence of Ryles’ tube</td>
<td>3.08 (1.4-6.6)</td>
</tr>
<tr>
<td>Presence of bedsores</td>
<td>5.67 (2.93-11)</td>
</tr>
<tr>
<td>SOPD follow up (Yes vs No in past 6 months)</td>
<td>2.71 (1.90-3.87)</td>
</tr>
<tr>
<td>Toileting dependency</td>
<td>2.03 (1.56-2.64)</td>
</tr>
</tbody>
</table>

Discussion

At present, C&A Home, nursing homes (run by NGOs) and infirmarys (run by HA) are under great demand with waiting time in terms of years of duration. Private nursing homes has become an important placement when elderly are faced with medical illness that result in acute deterioration of health and disabilities. This account for large proportion of residents suffering from cerebrovascular accident and fractures (notably hip fractures) residing in PNH. Chronic medical illness like congestive heart failure, chronic obstructive airways disease, dementia and parkinsonism make up a significant proportion of diagnosis. Only 5.3% of residents suffer from cancer of all sorts suggest that PNH as a terminal care placement is not common.
This echoes with the most common medical diagnosis resulting in disability (either catastrophic or progressive disability) in a cohort of 6070 elderly over 70 years old in 3 communities in USA\textsuperscript{4} which included cerebrovascular accident, hip fracture, congestive heart failure, pneumonia, ischaemic heart disease, cancer, diabetes mellitus and dehydration. Cross sectional data in Hong Kong of 2032 elderly also reveal that stroke, dementia and fractures are the main chronic diseases associated with severe functional limitation in elderly\textsuperscript{6}.

Table 2 shows the comparison of demographic characteristics between residents of PNH of Hong Kong and that of other countries. There is similarity between Japan and Hong Kong though the data from Japan included all residents (n=1255) from 15 Hokkaido facilities, representing the three types of nursing homes and long-term hospitals in Japan in 1993.

Table 2: Age and sex distribution (%) of nursing homes residents in other countries\textsuperscript{6}

<table>
<thead>
<tr>
<th>Country</th>
<th>Denmark</th>
<th>France</th>
<th>USA</th>
<th>Japan</th>
<th>Hong Kong</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;65</td>
<td>4.2</td>
<td>10.2</td>
<td>6.5</td>
<td>4.6</td>
<td>5.2</td>
</tr>
<tr>
<td>65-74</td>
<td>10.9</td>
<td>15.0</td>
<td>12.4</td>
<td>14.0</td>
<td>15.9</td>
</tr>
<tr>
<td>75-84</td>
<td>34.8</td>
<td>30.5</td>
<td>33.9</td>
<td>46.3</td>
<td>45.2</td>
</tr>
<tr>
<td>85+</td>
<td>50.1</td>
<td>44.3</td>
<td>47.2</td>
<td>35.2</td>
<td>33.7</td>
</tr>
<tr>
<td>Female Gender</td>
<td>76.2</td>
<td>69.9</td>
<td>73.2</td>
<td>71.7</td>
<td>71.0</td>
</tr>
</tbody>
</table>

The health profile of PNH residents showed that they require much care. 31% are bed-bound, 50% are dependent in ADL in some ways, 41% have problems of incontinence, 73% need administration of regular medications and 3.5% of them require Ryles’ tube. The private nursing homes scenario in Hong Kong is the same as other countries where residents are increasingly older, more ill and more functionally dependent\textsuperscript{7,8}. Urinary incontinence prevalence is quoted as 43-65% in PNH in seven foreign countries\textsuperscript{9}. Restrainer use of 13.3% in our setting is lower than that of nursing homes in United States, which is about 25-85% before the implementation of OBRA ‘1987 regulations\textsuperscript{10}. However, the figures in United States include restraint by means of chairs with locking lap and full side-rails which is not included in our study. The frequency of using restrainer is the same as countries like France, Italy, Sweden and Australia which give restrainer use of about 13-17%\textsuperscript{11}. Lowest rate of restrainer use is in Denmark and Japan with reported rate of < 9%. The prevalence of pressure ulcers is 7% in local setting and is lower than that of Ohio nursing homes with pressure sores of 12%\textsuperscript{12}.

United States intermediate care nursing home or skilled nursing home residents show a cumulative hospitalization rate of 57% at 6 months from a cohort follow up prospectively\textsuperscript{13}. Our local figure is 50%, which is similar though it is a retrospective figure. This shows that PNH residents do need hospital support. One study\textsuperscript{14} cited three reasons for hospitalizations, 70% are due to lack of intravenous therapy, 15% due to poor doctor nurse communication and lack of diagnostic services while 15% are due to pressure from family or nursing home staff. Infection of the skin and lung, symptomatic urinary tract infections and fevers of uncertain source occur most frequently\textsuperscript{15}.

Our profile showed that about 40-50% of PNH residents could be classified as frail elderly. The type of medical illnesses, number of medications per resident, demographic characteristics, rate of hospitalizations, presence of pressure ulcers and incontinence of our PNH residents are comparable with other developed countries. However, as PNH in Hong Kong lack well-qualified staff, more support should be given to these PNH. This can be in form of community outreach team providing service at PNH. Study has been done over six years showing that introduction of regular visits to nursing home by a physician can reduce hospitalizations and medical costs of these frail older patient\textsuperscript{16}. Targeting on frail residents with risk factors as identified in the study may lead to a reduction in hospitalizations.

Our study has several limitations. First, the studied population of PNH is confined to randomly selected homes in Hong Kong East Region, as it is part of the project of the community geriatric team of the hospital. Secondly, retrospective documentation of hospitalization and out patient attendance may result in some degree of errors. Counterchecking with hospital computer record is difficult, as names of PNH are usually not written down and some patients use their home address instead of PNH address.

Conclusions

PNH residents belong to a very frail elderly group. Most are sufferers of chronic medical illness and 50-70% is dependent in some ways in mobility and basic activities of daily living. Hospitalization rate is about 50 % over six months’ period and attendance at Specialist Out-patient Clinic is about 60%. Old age, increase in number of medical diagnosis and medications, dependency in toileting, presence of Ryles’ tube or bedsores are associated with increased rate of hospitalizations. Profile of
PNH residents is comparable with that of other developed countries. Poor medical, functional and high dependency nursing care profile of PNH residents justified CGAT support. The extent of which CGAT support can result in reducing hospitalizations, reducing development of complications like bedsores, reducing use of restrainer and improving functional status of residents need confirmation by future studies.

References

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**LEARNING POINTS**

1. Private nursing homes residents are frail. 31% are bed bound, 50% dependent in ADL, 41% have incontinence and 3.5% required Rye’s tube feeding.
2. Before the introduction of CGAT to PNH, the cumulative hospitalisation rate over six months was 50%. This was comparable with the hospitalisation rate of 57% at intermediate care / skilled nursing homes in the States.
3. There is a need to support PNH through CGAT services and the outcomes need to be evaluated.