immunogenicity and safety of intradermal trivalent influenza vaccination in nursing home older adults: a randomized controlled trial

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Background: Immunosenesence in older adults contributes to unsatisfactory immunogenicity towards influenza vaccine. Intradermal (ID) administration of influenza vaccine improves immunogenicity due to the abundance of immunostimulatory cells, such as dendritic cells in the dermis. It has comparable or even superior immune response and comparable post-vaccination adverse events than intramuscular (IM) administration in healthy older population. Nevertheless, there is no study regarding the immunogenicity of ID influenza vaccination in nursing home older adults, who are commonly frail and immunocompromised. Objective: To compare the immunogenicity and safety between full-dose (15 μg) IM and ID immunisation of the trivalent influenza vaccine in nursing home older adults. Methods: A single-centre, randomised, controlled, open-label, parallel group trial was conducted from October 2013 to April 2014 in 9 nursing homes of Hong Kong West Cluster, Hospital Authority. Baseline measurements included demographics, comorbidity, frailty, and nutritional status. Day-21 and day-180 immunogenicity (seroconversion rate, seroprotection rate, and geometric mean titre [GMT] fold increase in antibody titre) using haemagglutination-inhibition of ID compared to IM vaccination was analysed. Safety was evaluated by the presence of any adverse effect. Referred to previous study comparing ID and IM vaccination in healthy older adults, 40 subjects per group were needed to demonstrate non-inferiority, based on a 2-sided test, with type I error rate of 5%, 80% power and a non-inferiority tolerance margin of 1.5. Participants and their relatives needed to sign informed consent before participation. The study was registered on ClinicalTrials.gov (identifier: NCT01967368). Results: 100 nursing home older adults (mean age, 82.9±7.4 years; male 36%) were randomised. Baseline characteristics were similar between 2 groups. At day 21, non-inferiority in immunogenicity of the ID vaccination was demonstrated. The seroconversion rate of the H1N1 strain was significantly higher in the ID group. At day 180, immunogenicity of both groups fell but the GMT of all strains in ID group was higher and the difference was significant for H3N2 strain. The seroconversion rate and GMT fold increase of H3N2 strain was significantly higher in the ID group. Local adverse events were significantly more in ID group but they were mild and resolved in 72 hours. Conclusions: ID vaccination of influenza vaccine is non-inferior to IM vaccination in immunogenicity in nursing home older adults. Furthermore, ID vaccination is superior in some components of the immunogenicity assessment without compromising safety. ID vaccination is a good alternative to IM vaccination in frail nursing home older adults to induce better immunogenicity against influenza.

Impact of dementia on short-term outcomes of elderly patients with hip fractures undergoing in-patient rehabilitation

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Background: Hip fracture is a devastating injury for elderly and causes major loss in functional ability. Evidence is conflicting for functional recovery of dementia patients in hip fracture rehabilitation. Objective: Primary objective was to investigate whether dementia patients could benefit from hip fracture rehabilitation. Secondary objectives were to explore the characteristics of dementia patients undergoing hip fracture rehabilitation and to identify predictors for rehabilitation outcomes. Methods: Elderly patients admitted for hip fracture rehabilitation from 2007 to 2012 were retrospectively recruited. Those aged <65 years or with non-osteoporotic fractures were excluded. Baseline characteristics and rehabilitation scores were collected. Cumulative Illness Rating Scale for Geriatrics, including the sub-score of Cumulative Total Score (CTS), was used to quantify patient’s premorbid state. Dementia diagnosis was based on medical records; patients were grouped into the dementia group and non-dementia group and compared in terms of rehabilitation outcomes including Elderly Mobility Scale (EMS) and Modified Barthel Index (MBI). Regression models were constructed to predict rehabilitation outcomes. Results: A total of 323 patients (mean age, 83.6 years) were recruited. 216 (66.9%) of them were female. 254 (78.6%) patients were living in community before admission. 245 (75.9%) patients were able to walk unaided/with stick before admission. The dementia group was more likely to be institutionalised before admission (29.2% vs. 17.9%, p<0.05). Abbreviated Mental Test (AMT) score was significantly lower in the dementia group than non-dementia group (4.36 vs. 6.87, p<0.05). The dementia group also had significantly lower EMS (3.94 vs. 5.84, p<0.05) and MBI (36.84 vs. 55.99, p<0.05) on admission. Improvement in rehabilitation scores was noted in the dementia group upon discharge (EMS: 5.59 vs. 3.94, p<0.05; MBI: 50.2 vs. 36.84, p<0.05). For the community-living patients before admission, the dementia group was more likely to be discharged to institution after in-patient rehabilitation, compared with the non-dementia group (36.1% vs. 21.7%, p<0.05). Linear regression analysis showed that admission EMS, premorbid ambulatory state,
Body mass index and nutritional status are predictors of functional improvement from rehabilitation in older patients

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Background: Effective rehabilitation can help older patients regain function and independence during recovery. Body weight and nutritional status may influence rehabilitation outcome for older patients, but this relationship remains unclear. Objective: This study explored the impact of body mass index (BMI) and Malnutrition Universal Screening Tool (MUST) score in determining functional outcome during general rehabilitation in older patients. Methods: A UK-based prospective study was conducted for the correlation between BMI and MUST score with rehabilitation outcome. Older patients undergoing general (non-stroke, non-orthogeriatric) rehabilitation were recruited from 2 rehabilitation units (of the Royal Bournemouth Hospital) over 2.5 years. All patients had BMI and MUST scores calculated. MUST score was calculated from a combination of 3 components: BMI score + weight loss score + acute disease effect score; a higher MUST score of ≥2 delineated a worse nutritional status. Cognitive function was measured using the Mini Mental State Examination (MMSE). Functional improvement during rehabilitation was assessed by calculating the difference between the admission and discharge Barthel Index. Comorbidity level was assessed using the validated Charlson Comorbidity Index. Informed consent was obtained from all patients. Results: 115 patients were recruited (70 were females) and the mean age was 84.7 (SD, 6.3) years. 80 (69.5%) of patients showed functional improvement in their Barthel Index. There was no significant difference in gender, admission Barthel Index, Charlson Comorbidity Index, or MUST between those with and without functional improvement. Patients with BMI of <20 were significantly less likely to show functional improvement (14/35 vs. 14/80, p=0.01), and patients showing functional improvement had a significantly higher BMI (24.1 vs. 20.9, p=0.03). These results remained significant after adjusting for case mix (p=0.02). Patients with a MUST score ≥2 were less likely to show functional improvement (14/35 vs. 13/80, p=0.008), and those with a MUST score of <2 had a higher rate of functional improvement on Cox regression analysis. Conclusions: Low BMI and poor nutritional status are independent predictors of lower functional gain from rehabilitation in older patients. Further research on the effects of improving the BMI and nutritional status as a strategy to improve rehabilitation outcome is warranted.

Mortality and prognostic predictors in bullous pemphigoid: an inter-subspecialty cohort of Chinese nursing home older adults

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Background: Bullous pemphigoid (BP) is the commonest autoimmune blistering disease in elderly. It affects primarily frail older patients with dependent activity of daily living. BP is associated with significant long-term all-cause mortality. The effect of BP on the overall mortality in patients living in the residential care homes for the elderly (RCHE) is not well known. Knowledge on the predictors for poor survival outcomes in Chinese patients with BP is limited. Objective: This study aimed to determine the 1-year, 2-year, and 3-year mortality rates of BP in patients living in the RCHE and to identify specific prognostic factors associated with poor survival outcomes. Local epidemiology, functional, clinical, biochemical, immunological characteristics, and treatment strategies of the patients with BP were also described. Main outcome measures: The 1-year, 2-year, and 3-year mortality rates of BP in patients living in the RCHEs, the independent predictors for poor survival outcomes and the descriptive data on the local epidemiology, functional, clinical, biochemical, immunological, and therapeutic characteristics of patients. Methods: A retrospective, case-control cohort study of 266 patients living in the RCHEs who were diagnosed with BP between 2001 and 2011 was conducted. Demographic data, clinical, laboratory, and treatment records were reviewed. The mortality rate of the patients was compared with age-, gender- and comorbidity-matched controls at a ratio of 1:3. There were 1078 patients (266 cases and 812 controls). Results: The 1-year, 2-year, and 3-year mortality rates were 51.9%, 72.9%, and 83%, respectively. The mean age at diagnosis was 85 ± 7.9 years. 94% of the patients had dependent activity of daily living. The mean baseline Charlson Comorbidity Index was 2.1 ± 1.1. Multivariate analysis showed that BP was an independent predictor of mortality (hazard ratio [HR], 3.7; 95% confidence interval [CI], 3.1-4.4; p < 0.001). BP was associated with a higher rate of infection-related mortality (HR, 4.0; 95% CI, 3.3-4.9; p < 0.001). Older age [OR, 1.02; p = 0.03], increased number of admissions in the preceding year prior to the diagnosis of BP (OR, 1.12; p = 0.001), generalised disease (OR, 1.37; p = 0.05), and serum albumin level at time of diagnosis (OR, 0.93; p < 0.001) were independent predictors for mortality in BP patients. The use of systemic corticosteroid was associated with faster rate of skin recovery (p = 0.02), but had no effect on the survival and relapse rate of BP. Conclusions: BP is associated with significant risks of the all-cause and infection-related mortality in patients living in the RCHEs. Special attentions on the nutritional and general medical needs are warranted. Individual predictors may help stratification of the death risk among these patients.
Systemic corticosteroid therapy has a role in symptomatic control, but the effect on long-term survival remains questionable.

**New paradigms in stroke rehabilitation: empowering patients and carers by multidisciplinary team interventions can improve efficiency**

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**Background:** Stroke causes disability responsible for the largest number of hospital bed-days in Hong Kong per year. Complex needs and social issues result in prolonged hospital stay. Empowering patients and carers early is vital in rehabilitation and discharge planning. However, the optimal means to achieve is unclear. **Objective:** This study aims to determine if empowering patients and their carers in the Stroke Rehabilitation Unit (SRU) by multidisciplinary team interventions can reduce length of stay, achieve functional gain and carer satisfaction. **Methods:** This is a pre- and post-intervention comparison of all SRU patients between 2011 and 2012. Measures implemented at the end of 2011 aimed for functional gain and early return to community included (1) weekly 'Bedside Carer Round' where 5 members of the rehabilitation team spent 10 minutes per patient to inform carers on 5 key areas: prognosis, goals, care techniques, discharge options, and discharge date; (2) 'Weekend Rehabilitation Practice' with 5 steps: therapist training, activity prescription, patient consent, nurse supervision, and facilitated flexible visiting hours. A ward rehabilitation room provided facilities; (3) nurse education programme; (4) supported discharge with fast track day rehabilitation, respite care arrangement, stroke patients support group, and community resources; and (5) rehabilitation with task specific training and spasticity management. Data was obtained from the SRU registry and CDARS. Outcome measures were length of stay (LOS) in SRU and rehabilitation gain represented by a change in Barthel index (BI) score (discharge BI minus admission BI). A carer satisfaction survey was conducted. **Results:** There were 107 patients in the SRU in 2011 versus 118 in 2012. The median LOS significantly reduced by 3 days (16.6%) from 18 (interquartile range, 12.7-29) days in 2011 to 15 (interquartile range, 8-23) days in 2012 (p=0.044, Mann-Whitney U test). This was equivalent to 2570 per 1000 bed days saved in our 62 bed convalescent wards. The 2 groups did not significantly differ in admission impairment (National Institutes of Health Stroke Scale) and disability (Barthel index) scores. The mean BI gain was 14.3 (SD, 13.3) in 2011 and 14.0 (SD, 15.6) in 2012 (p=0.9, t test). The 28-day readmission rate was 12.1% in 2011 and 10.2% in 2012. Fast track post-discharge services were organised for 59% (<2 weeks) for day rehabilitation, and 66% (<6 weeks) stroke clinic. Carer survey revealed 91% rated weekly ‘Bedside Carer Round as ‘very necessary’ and 93% were satisfied with this systematic model for carer participation. A minority preferred a more private setting to patient’s bedside. Feedback from team members agreed the programme main benefits were through (1) heightening rehabilitation awareness through enabling patients to practice supervised activities at weekends and (2) enhancing communication through “1 team, 1 message” which prevented conflicting messages and saved time. **Conclusions:** Early carer empowerment by a multi-component team intervention reduced LOS by a median of 3 days without compromising rehabilitation gain. This strategy strengthened ward rehabilitation culture to engage carers early in the rehabilitation of stroke patients.

**SUBMITTED FREE PAPERS**

**Retrospective study of the impact of the Virtual Ward Programme on the high-risk community patients**

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**Background:** Community-dwelling frail elderly patients with multiple comorbidities were at high risk of unplanned hospital admission and prolonged hospital stay. Age at community is the common goal of patients, caregivers, and health care workers. Virtual Ward Programme was a transitional multidisciplinary community care ‘Hospital at Home’ model aimed at provision of intensive medical and nursing care for the high-risk patients and their caregivers in the community. The Virtual Ward Team consisted of geriatrician, palliative care physician, community nurses, health care assistant, and a clerk. Suitable patients with good family support would be recruited in the programme for 1 to 3 months. **Objective:** To evaluate the impact of Virtual Ward Programme on the demand of emergency medical care and secondary health care service of high-risk patients in Hong Kong. **Methods:** This was a retrospective observational case notes review study. Patients who were under the care of the Virtual Ward Programme between 1 October 2011 and 30 June 2012 were recruited. Descriptive data of patient demographics, disease category, emergency department attendance, number of hospital days and received interventions were analysed. **Results:** 133 patients (mean±SD age, 83±10 years) received the Virtual Ward Programme, with a mean Canadian Study of Health and Aging Clinical Frailty Scale of 8±1, a mean Charlson Comorbidity Score of 6±3, and a mean Hospital Admission Risk Reduction Programme for the Elderly score of 0±0.2. The sex distribution and case distributions were approximately equal (male:female, 44.6%:55.4%; geriatric:palliative, 55%:45%). The mean...
Weight loss after a stroke may have an inflammatory component. Particularly TNFα levels. These data suggest that weight loss after a stroke may have an inflammatory component.

**Foot problems among elderly people in Hong Kong**

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**Objective:** To evaluate the prevalence and pattern of foot problems, and walking stability among a sample of elderly in Hong Kong. **Methods:** Cross sectional survey. **Subjects:** Elders from social community centres. **Main outcome measures:** Characteristics of the subjects, foot conditions and patterns, and effects on mobility. **Results:** 85 subjects were recruited from 3 social elderly centres. Foot problems were prevalent, and 81.2% had at least one foot condition. The 4 most common foot problems were callus (44.7%), hallux deformity (36.5%), dystrophic nail (27.1%), and nail onychomycosis (23.5%). 44.7% had foot pain and 61.2% were aware of their foot conditions, but only 28.2% seek medical opinions. Only 58.8% had property fitted footwear. Their elderly mobility scale score was normal, with a median 17 of 20 (range, 15-17). **Conclusions:** Foot health problems are prevalent in our elderly population, but they seldom seek consultation. Poorly fitted footwear is also very common. There is no mobility impairment among elders with minor foot problems. Knowledge of common foot conditions and footwear is deficient among them, education on these issue is necessary to promote the elders’ good foot health.

**Prevalence and risk factors of depressive symptoms in elderly patients with chronic obstructive pulmonary disease**

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**Background:** Chronic obstructive pulmonary disease (COPD) and depression are common among elders in Hong Kong. Depression is reported to be prevalent among COPD patients, but their association is not well known in our locality. **Objective:** The primary aim was to investigate the prevalence of depressive symptoms in elders with clinically stable COPD. The second aim was to determine if the elderly with COPD had more depressive symptoms than controls. The third aim was to identify risk factors

**Weight loss after stroke is related to inflammatory status and stroke severity**

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**Background:** Weight loss in older people is a common and problematic phenomenon, and is associated with poor outcome including increased risk of infections, ulcers, and mortality. Inflammation may have a role in weight loss in conditions such as cancer and Alzheimer’s disease, through mechanisms such as cytokine inhibition of gastric function and hormones. The mechanism for weight loss after a stroke is unclear, but an inflammatory component is postulated. **Objective:** This study explored whether weight loss after a stroke was associated with inflammatory status and stroke severity. **Methods:** A UK-based prospective study of the correlation between stroke severity, inflammatory status, and weight loss was conducted. Stroke patients admitted to the acute stroke unit (of the Southampton General Hospital, UK) were recruited and followed up for 2 years. Patients were assessed at baseline (within 72 hours of stroke), 6 months, and 2 years. Right and left mid-arm muscle circumferences (MAMC) and triplicate biceps and triceps skin folds were measured. MAMC was used as an anthropometric proxy for body mass index in those who could not have height or weight measured. Means of the triplicates were used to calculate proportion body fat. Changes between baseline follow-up were calculated. Inflammatory cytokines (IL-6 and TNFα) were measured by ELISA in plasma taken at baseline, 6 months, and 2 years. **Results:** 37 stroke patients (mean±SD age, 70±8 years) were recruited. Overall, the stroke patients showed a decrease in MAMC (32.2±3.7 cm vs. 30.8±3.9 cm, p=0.009) but no change in body fat. Most of the decrease in MAMC appeared in the first 6 months. The change in MAMC was associated with lower systolic blood pressure on admission (r=−0.417, p=0.022), a more severe stroke (Barthel Index <72 hours after stroke; r=−0.450, p=0.006; and at 6 months, r=−0.350, p=0.049), increased IL-6 level at 6 months (r=0.458, p=0.007), and increased TNFα level (r=0.425, p=0.012). There was no association with stroke subtype, post-stroke infection, or nasogastric tube feeding. Multivariate analysis suggested that a model containing TNFα alone was associated with 55% of the variation in change in MAMC seen in the stroke group. **Conclusions:** After stroke, there was a reduction in MAMC over 2 years, particularly in the first 6 months. Stroke patients with the largest reduction in MAMC tended to be those with the most severe strokes and the highest level of pro-inflammatory cytokines, particularly TNFα levels. These data suggest that weight loss after a stroke may have an inflammatory component.
associated with depressive symptoms among elders with COPD. **Methods:** This study was a cross-sectional, case-control study. 55 elders with clinically stable COPD from the COPD clinic and 55 elders from the geriatric clinic of Kwong Wah Hospital formed the case group and control group. Basic demographics and clinical characteristics were collected. Depressive symptoms were assessed using the Chinese version of the Geriatric Depression Scale (GDS) short form (15 items). **Results:** The prevalence of depressive disorders in elders with COPD and controls were 21.8% and 3.6%, respectively. The median GDS score was 3 (range, 2–7) in COPD groups and 2 (range, 1–4) in controls (p=0.001). Univariate analysis identified that the (1) Borg scale, (2) activity domain score in the St. George's Respiratory Questionnaire, (3) 6-minute walk distance, (4) body mass index, (5) BI-20, (6) Modified Medical Research Council scale, and (7) BODE score were associated with depressive symptoms in COPD. The regression model showed that the BODE index was a strong associated factor, with an odd ratio of 1.8 (p=0.003). **Conclusions:** A significant proportion of stable COPD elders had depressive symptoms, which was significantly more than the elderly without COPD. COPD disease seemed to increase the likelihood of a depressive mood, compared with other chronic illnesses, and the BODE index was associated with them. Early screening for depressive symptoms among the elderly with COPD might be warranted.

**To characterise and compare delirium patients managed in a geriatric unit versus in general medical wards in a tertiary acute hospital: a case-control study**

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**Background:** Delirium is an acute confusion state. It is a common and costly condition facing elderly acute medical in-patients. Delirium is associated with short- and long-term mortality. Different complications are related to delirium if these patients are not managed well. **Objective:** This study aimed to study the incidence, prevalence, features, risk factors, and outcomes of patients with delirium managed in a sub-acute and rehabilitation hospital. **Methods:** A cohort study was performed in the Shatin Hospital from January to June 2013. Delirium patients were screened by ward visits, and the confusion assessment method (CAM) score assessed. The background demographics, comorbidities, drug lists, features of delirium, and the reported delirium onset time were recorded. Each subject was reviewed at least daily until discharge to determine the duration of delirium, the features of delirium, and complications arising from the delirium. A same number of non-confused subjects were recruited for comparison. **Results:** The prevalence of delirium was 1.37% (47/3437), with an incidence of 0.73% (25/3437). Background dementia was the most relevant background predisposing comorbidity (p<0.05). In the incident cases, precipitating factors within 2 weeks of delirium onset were any falls or trauma (p<0.05), faecal impaction (p<0.05), and pain (p<0.05). Incident delirium patients used more physical restraints in the acute hospital (p<0.05) and more chemical restraints in the sub-acute and rehabilitation hospital (p<0.01). There was no difference in the length of stay, 28-day readmission, in-patient and 6-month mortality rates between the 2 groups. **Conclusions:** Some precipitants of delirium could be preventable by good nursing care. Iatrogenesis, especially restraints use, needs to be further studied in larger scale on its role in precipitating incident delirium as they are important preventable risk factors.