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Delayed Hospital Discharges; Could Pressure Sore Incidents in Fractured Neck of Femurs Patients and Elevated Nutritional Needs be a Contributing Factor?

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Abstract

Background Development of pressure ulcer (PU) during hospital admission causes morbidity and distress to the patient, places immense strain on nursing resources and delaying patient?s discharge and possibly increasing mortality rates. Fracture neck of femur(NOF) in the elderly population is recognised as a high-risk factor for development of PU. Aims:The aim of this retrospective observational study was to analyse data to assess prevalence rates of PU development in NOF patients during hospital admission amongst the elderly population. Methods: The data was collected from the National Hip Fracture Database (NHFD) on patients admitted with NOF between 1st April 2015 â?? 30th September 2015 in a Trauma and Orthopaedic Regional Centre Research Unit. East Sussex Hospital Trust. Results: 258 patients with NOFwere included in this study, predominantly females. NOF patients with PU were older and had prolonged average length of stay compared to patients with NOF without PU respectively (25.3 days Vs 19.2 days). Average body mass index (BMI) in NOF patients with PU was higher compared to patients with NOF without PU (24.45kg/m2 vs. 23.4kg/m2 respectively, P = 0.038). This study showed an increased incidence rate of PU in the higher age group and those with higher BMI. Conclusions: Patients with NOF are at higher risk of malnutrition during hospital admission secondary to elevated nutritional requirements for wound healing and recovery. Therefore, authors recommend that all individuals are nutritionally screened on admission using a validated tool and commenced on appropriate nutritional support plan devised by specialist dietetic team

Index terms—
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Results: 258 patients with NOF were included in this study, predominantly females. NOF patients with PU were older and had prolonged average length of stay compared to patients with NOF without PU respectively (25.3 days Vs 19.2 days). Average body mass index (BMI) in NOF patients with PU was higher compared to patients with NOF without PU (24.45kg/ m2 vs. 23.4kg/m2 respectively, P = 0.038). This study showed an increased incidence rate of PU in the higher age group and those with higher BMI.

Conclusions: Patients with NOF are at higher risk of malnutrition during hospital admission secondary to elevated nutritional requirements for wound healing and recovery. Therefore, authors recommend that all individuals are nutritionally screened on admission using a validated tool and commenced on appropriate nutritional support plan devised by specialist dietetic team.

1 I. Background

alnutrition is defined as an imbalance of energy, protein and other macro/micronutrients, which lead to measurable adverse effects on body, physical function and clinical outcome. Although malnutrition has been associated with increased risk of falls **??**Lumbers et al, 2003), prolonged recovery time and accountable for a percentage of disability and death in the elderly population, **??**Hayes et al. 1996). Factors such as loss of appetite, unintentional weight loss, fatigue, depression and poor concentration levels have all been linked with malnutrition.

According to the Office of National Statistics report in 2000, the elderly population (classified as people aged over 65 years) account for 16% of the total population in the UK with an estimated rise to 20% by 2021. This population group has been identified at being at increased risk of malnutrition, with higher prevalence rates in those residing in nursing homes and those admitted to hospital. Additionally, physical abilities such as reduced mobility or being bedbound have also been associated with higher risk of malnutrition. Furthermore, BAPEN's Nutrition Screening Week surveys indicated that 25-34% of patients admitted to hospital are at risk of malnutrition. Public expenditures on disease related malnutrition in UK in 2007 exceeded £13 billion. It is well established that recognising and identifying the problem is the key in order to overcome malnutrition prevalence in the acute setting. Once individuals at risk are identified, implementation of easy measures such as increased caloric intake may be enough to reverse the downward cycle and prevent further deterioration.

2 a) Neck of Femur Fracture (NOF), Pressure Ulcers (PU) and Malnutrition

A neck of femur fracture (NOF) is defined as a hip fracture in which the neck of the thigh bone known as femur is partially or completely broken. Conditions such as diabetes, osteomalacia and osteoporosis, rheumatoid arthritis, hyperparathyroidism and maternal history of hip fracture have all been previously associated with increased risks of NOF fractures.

Nematy et al in 2006 illustrated that patients with fractured NOF were likely to be malnourished on admission and more importantly experienced significant rapid deterioration in their nutrition status during hospital admission. Dietetic intervention has also been highlighted as an integral part of patient care as fractured NOF patients continue to be in a hypermetabolic state for three months' post-surgery which may lead to delayed hospital discharge, slower recovery rates or even readmission **??**Paillaud, et al 2000). Furthermore, Myint et al, 2012 compared the use of a ready-to-use oral nutritional supplementation (ONS) containing 18-24 g protein and 500 kcal per day in addition to hospital diet with hospital diet only in 126 patients. Results indicated a significant difference in change in BMI with a decrease of 0.25 and 0.03 kg/m 2 in the ONS group and 0.72 and 0.49 kg/m 2 in the control group at hospital discharge and follow-up, respectively ($P = 0.012$). The length of stay in rehabilitation ward was also shortened by 3.80 ($P = 0.04$) days in the ONS group.

Development of PU during hospital admission causes morbidity and distress to the patient, places immense strain on nursing resources and consequently delaying patient's discharge and possibly increasing mortality rates. Traumas such as hip fractures in the elderly population are recognised as a high-risk factor for development of PU. According to a study by **??**aleem et al (2008) 3.8% of patients admitted to hospital developed PU. Factors such as increased age, diabetes mellitus, a lower mental test score, a lower mobility score were identified as contributing factors to the development of PU.

Incidence rates of between 8.8% and 55% have been so far reported. Lindholm et al **??**2008) showed 10% of patients had PU on admission but more importantly 22% developed PU on discharge. Furthermore, Rademakers et al (2007) demonstrated development of PU was associated with prolonged postoperative hospital stay (19.5 vs. 11.1, $p = 0.001$). The National Hip Fracture database report for 2013 also showed that 3.5% of patients admitted with fractured NOF developed PU during their hospital admission. These figures have improved noticeably from 3.7% in 2012 and 6% in 2010.

Nutrition is an important aspect of a comprehensive care plan for prevention and treatment of PU **??**Thomas et al 1996 **??** 1997 **??** Pinchcofsky-Devin et al 1986), and it is of paramount importance to address nutrition in every individual with PU by ensuring patients receive adequate calories, protein, fluids, vitamins and minerals required by the body for maintaining tissue integrity and preventing tissue breakdown.

NICE guidelines (CG179), 2014 and National Pressure Ulcer Advisory Panel in 2009 suggests a dietitian or other healthcare professional with the necessary skills and competencies should nutritionally screen adults with PU. The screening should be used as a tool in order to identify those with nutritional deficiencies and provide optimum nutrition care plans in which the use of nutritional supplements may be warranted.

3 b) Aims

To assess prevalence rates of pressure ulcer development in fractured neck of femur patients during hospital admission amongst the elderly population.

4 II. Method

The information shown has been collated from data entered on to the National Hip Fracture Database (NHFD) patients admitted with a fractured hip between 1 st April 2015 -30 th September 2015. BMI information was sourced from the notes and EQ/ERP data from Trauma and Orthopaedic Regional Centre Research Unit. East Sussex Hospital Trust.

5 III. Results

A total of 258 patients with NOF (average age of 82.3 years) were included in this study, of which 69% (178/258) were females and 31% (80/258) were males. In addition, 4% (10/258) of patients with NOF developed PU during inpatient stay with a gender distribution of 60% (6/10) females and 40% (4/10) males. The average age of patients in the NOF and PU group was 84.4 years. NOF patients with PU had prolonged average length of stay compared to patients with NOF without PU respectively (25.3 days Vs 19.2 days). Average BMI in NOF patients with PU was higher compared to patients with NOF without PU (24.45kg/m2 vs. 23.4kg/ m2 respectively, P = 0.038).

6 IV. Discussion

Findings from analytical data showed a 4% incident rate of PU development in NOF patients at East Sussex Hospital Trust which is a similar result to the recorded 3.5% rates by the National Hip Fracture database report for 2013. Many studies so far have highlighted the increased nutritional requirements in this vulnerable group however quite often despite attempted adherence to NICE nutrition guidance, involving nutritional screening tools, care plans and protected mealtimes; acutely unwell, malnourished patients are often not receiving their estimated nutritional requirements due to lack of adequate staffing on wards or assistant and encouragement required during meal times in order to optimise nutritional intake.

This study showed PU incident rate levels were predominately seen in the slightly higher age group, which could potentially be linked to lower dietary intake secondary to factors such as poor dentition, loss of taste and smell sensation contributing to lack of appetite, cognitive impairment/dementia, impaired vision, poor dexterity and changes in gastrointestinal function leading to constipation and/or impaired nutrient absorption. Moreover, findings indicated a higher PU incident rates in patients with a slightly higher BMI, although still within healthy range (**??**8 contributing to these results may include: 1) higher nutritional requirements for energy and protein of such patients not being met as they may be perceived as individuals with healthy BMI from observation, and 2) lack of mobilisation and being bed-bound during admission post-surgery and inadequate levels of regular turning/repositioning and monitoring of PU areas. One of the major limitations of the study includes lack of data on establishing patient's nutritional intake during hospital admission in both groups and assessing whether estimated nutritional requirements were being met. Further studies to include other cofounding factors such as demographic data of the patients in the two groups and their predictive variables are required to confirm current findings.

7 V. Conclusions and Recommendations

Patients with NOF are at higher risk of malnutrition during hospital admission secondary to elevated nutritional requirements for wound healing and recovery. Often due to long period of hospital admission post-surgery, factors such as reduced mobility, infections, loss of appetite and change in living environment impact patient's dietary intake and result in inadequate nutritional intake. Patients who are bedbound and present with an overweight BMI are potentially at higher risk of developing PU during admission. However given the lack of eliminating possible cofounding factors such as patient's actual dietary intake during hospital admission, authors conclude that correlation does not imply causation. In order to improve nutritional status in this vulnerable group of patients authors suggest that clinicians involved in the care of fractured NOF patients with or without PU should seek to ensure that all individuals are nutritionally screened on admission using a validated tool and commenced on appropriate nutritional support plan devised by registered dietitians, which may include provision of oral nutritional supplementation (ONS) to prevent weight loss during hospitalisation for hip fracture rehabilitation and potentially reduce length of stay.

8 Conflict of interest: none

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8 CONFLICT OF INTEREST: NONE

Figure 1: M

Abstract-Background: Development of pressure ulcer (PU)

Figure 2: