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Scientific letter

Real World Experience: Impact of a Specialist Interstitial Lung Disease Nurse on Health Care Utilization

Real world experience: impacto de una enfermera especializada en enfermedades intersticiales en la utilización de recursos de salud

Dear Editor,

Idiopathic pulmonary fibrosis (IPF) is a chronic, progressive fibrosing, interstitial pneumonia of unknown cause with a median survival of 3–5 years.[1,2]

To improve outcomes in IPF patients, expert panels from the United Kingdom National Health Service have recommended specialized centres with a specialist nurse.[3] However, no studies to date have investigated the impact of ILD nurses on health care utilization.

Our objective was to evaluate the impact of hiring an ILD nurse, on IPF patient hospitalizations and emergency room (HA/ER) visits.

In this retrospective cohort study the data required for the pre- and post-analysis were collected from the ILD clinic database and the patient care system (PCS) at Kingston Health Sciences Center (KHSC). The ILD clinic database contains socio-demographic and clinical information, pulmonary function test results, bronchoscopic and histopathological results, as well as high resolution chest computed tomography reports. Information regarding hospital admissions and ER visits was obtained from the PCS. The study protocol was approved by the Queen's University Research Ethics Board (TRAQ#: 6022752).

The cohorts before and after implementation of a specialist ILD nurse included all incident cases of IPF diagnosed in the ILD clinic at KHSC from May 2013, when the ILD clinic started, until December 2016. The diagnosis of IPF in the KHSC-ILD clinic was established following the ATS/ERS/JRS/ALAT diagnostic criteria.[1]

The ILD nurse at KHSC performs several clinical and educational roles to our IPF patients.

Hospital admissions and ER visits were obtained by linking the ILD clinic database with the PCS database, using hospital registration numbers, which allows a deterministic matching. We accounted only for the first admission to hospital or ER visit in our study.

We analysed the impact of implementing an ILD nurse on two cohorts based on the following periods:

1st cohort: We compared HA/ER visits 20 months before (May 2013–December 2014) and after the ILD nurse was hired (May 2015–December 2016).

2nd cohort: We compared HA/ER visits 16 months before (January 2014–April 2015) and after the ILD nurse was hired (January 2016–April 2017).

For both cohorts, we compared the combined hospital admission and ER visit cumulative incidence and incidence rate.

We also applied Cox proportional hazards to calculate the hazard ratios (HR) and logistic regression to calculate the odds ratios (OR) of HA/ER visits associated to having an ILD nurse. We adjusted for age, gender, forced vital capacity as percent of predicted; anti-

Table 1
Hospital admissions and ER visit rates before and after the ILD nurse.

	Before ILD nurse ($N=34$)	After ILD nurse ($N=40$)	
20 months before and after ILD nurse			
Cumulative incidence	23% (8/34)	17% (7/40)	*Unadjusted*: HR = 0.68; 95% CI 0.29–2.24; p-value = 0.68 OR = 0.69; 95% CI 0.22–2.15; p-value = 0.52
Incidence rate	49/100 person-years	44/100 person-years	*Adjusted**: HR = 0.55; 95% CI 0.16–1.92; p-value = 0.35 OR = 0.38; 95% CI 0.09–1.55; p-value = 0.18
	Before ILD nurse ($N=32$)	After ILD nurse ($N=35$)	
16 months before and after ILD nurse			
Cumulative incidence	22% (7/32)	11% (4/35)	*Unadjusted*: HR = 0.49; 95% CI 0.14–1.69; p-value = 0.26 OR = 0.46; 95% CI 0.12–1.75; p-value = 0.26
Incidence rate	53/100 person-years	28/100 person-years	*Adjusted**: HR = 0.26; 95% CI 0.05–1.25; p-value = 0.09 OR = 0.22; 95% CI 0.04–1.20; p-value = 0.08

* Adjusted for age, gender, FVC, anti-fibrotic treatment, Charlson comorbidity index and marital status.

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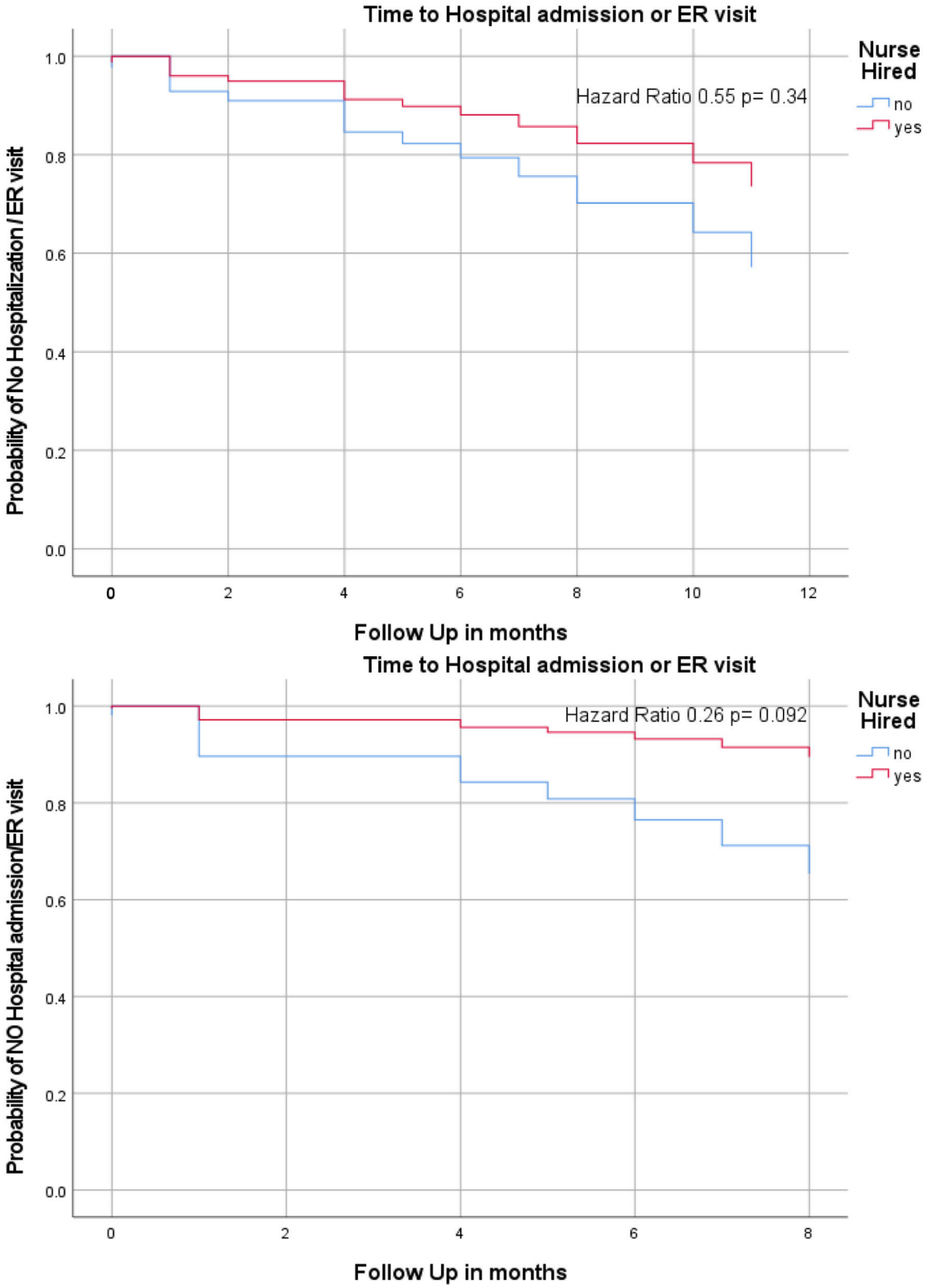

Fig. 1. (a) Kaplan–Meier curves comparing hospital admissions/ER visit 20 months before vs after hiring the ILD nurse. Hazard ratio adjusted for age, gender, FVC, anti-fibrotic treatment, Charlson comorbidity index and marital status. (b) Kaplan–Meier curves comparing hospital admission/ER visit 16 months before vs after hiring the ILD nurse. Hazard ratio adjusted for age, gender, FVC, anti-fibrotic treatment, Charlson comorbidity index and marital status.

fibrotic treatment, Charlson comorbidity index, and marital status. The statistical analyses were performed using SPSS 29.

We included all 74 incident IPF patients during the study period: 34 diagnosed before the ILD nurse started and 40 diagnosed after. The mean age was 74 years (min 54–max 90): 72% were males and 28% females.

The mean follow-up of all patients was 5.8 months (16.3 person-years) before and 4.8 months (15.9 person-years) after the ILD

nurse. All hospital admissions/ER visits before and after the ILD nurse was hired were due to respiratory causes, most of them IPF exacerbations +/− infection.

1st cohort – 20 months. The cumulative incidence of HA/ER visits in patients with IPF was 23% before and 17% after the ILD nurse was hired (Table 1). As shown in Table 1 and Fig. 1a, after adjusting for confounders, having an ILD nurse was associated with clinically relevant, although not-statistically significant, reduction of 45% in the risk of HA/ER visits at 20 months (HR: 0.55; 95% CI 0.158–1.917; p-value = 0.34). The adjusted odds ratio of HA/ER visits was also lower (0.38; 95% CI 0.09–1.55; p-value = 0.18). Thirty five percent of patients (12/34) died before and 8% (3/40) after the nurse was hired ($X^2 = 8.78$; p-value = 0.003).

2nd cohort – 16 months. The cumulative incidence of HA/ER visits in patients with IPF was 22% before and 11% after the ILD nurse was hired. As shown in Table 1 and Fig. 1b, having an ILD nurse was associated with a clinically relevant, but not-statistically significant, reduction of 74% in the risk of HA/ER visits at 16 months (HR: 0.26; 95% CI 0.055–1.247; p-value = 0.09). The adjusted odds ratio of HA/ER visits was also lower (0.22; 95% CI 0.04–1.20; p-value = 0.08). Thirty one percent (10/32) of patients died before and 3% (1/35) after the nurse was hired ($X^2 = 9.82$; p-value = 0.002).

To our knowledge, this is the first study to assess the impact of a specialist ILD nurse on health care utilization in patients with IPF. Our study showed that an ILD nurse reduced the number of HA/ER visits in newly diagnosed IPF patients. We show a clinically relevant reduction in HA/ER visits between 45% and 74% in the two cohorts analyzed.

Including a specialist nurse/care coordinator has been shown to improve patient adherence to medications,[4–6] satisfaction,[7] understanding of disease,[8–10] quality of life[11,12] and overall cost savings.[13]

However, this is the first study to evaluate the impact of an ILD nurse on hospital admissions and ER visits in IPF patients.

The reduction in hospital admissions and ER visits observed in our study may relate to improved patient adherence to anti-fibrotics after hiring an ILD Nurse, or by the impact of educating patients in the early identification of IPF exacerbations, and empowering patients to self-manage their exacerbations at home, among other possible benefits.[9,10]

The impact of this study may provide evidence for funding bodies to support ILD Care Teams to improve patient outcomes.

Our study has several limitations: we did not evaluate the reasons that explain the observed reduction in HA/ER visits; hence, we cannot determine the mechanisms by which our ILD nurse improved these outcomes. The reductions on health care utilization observed with an ILD nurse, although clinically relevant, were not-statistically significant; likely explained by the small sample size, since our results were consistent when measured as cumulative incidence or incidence rate, in two different cohorts, and time frames.

This study showed that hiring an ILD nurse could result in clinically relevant reduction in hospital admissions and emergency room visits.

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Authors' contributions

OM did the study design, data acquisition and statistical analyses. All authors contributed to the interpretation of the data and drafting the manuscript. All authors read and revised the content critically, approved the final manuscript, and are accountable for its content.

Conflicts of interest

The authors report no conflict of interest.

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Onofre Morán-Mendoza [a,b,*], Mohamed Khalil [c], Sharina Aldhaheri [d], Jiayi Xing [a], Ana P. Johnson [e,f,g]

[a] *Department of Medicine, Queen's University, Kingston, ON, Canada*
[b] *Kingston Health Sciences Center, Kingston, ON, Canada*
[c] *University of Toronto, Canada*
[d] *Tawam Hospital, Al Ain, United Arab Emirates*
[e] *Faculty of Health Sciences, Queen's University, Kingston, ON, Canada*
[f] *Department of Public Health Sciences, Queen's University, Kingston, ON, Canada*
[g] *Institute for Clinical Evaluative Sciences Queen's, Kingston, ON, Canada*

[*] Corresponding author.
E-mail address: morano@queensu.ca (O. Morán-Mendoza).