Using real-time data to improve patient no-shows and late cancellations

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Background: The Cystic Fibrosis Foundation (CFF) advises that all persons with cystic fibrosis (PwCF) visit a cystic fibrosis (CF) care center every 3 months for evaluation, treatment, surveillance, counseling, and education [1]. In March 2020, our clinic went into modified operations in response to the COVID-19 pandemic, necessitating a temporary change in our ability to conduct routine face-to-face visits. Within 1 month, we operationalized virtual visits in addition to face-to-face visits. During the pandemic, staff noticed a drop in clinic attendance, and we implemented a quality improvement (QI) plan to study and address this trend.

Methods: Our QI team is a multidisciplinary group that is part of the Cystic Fibrosis Learning Network (CFLN). We defined the clinic fill rate (CFR) as the number of people seen over the number of available clinic slots. Each week, we determined the number of PwCF scheduled the following week and compared that number to PwCF and cancellations that occurred during that 7-day period. We also determined the number of PwCF scheduled 1 month ahead to compare it with our weekly data. We used a key driver diagram to help focus our interventions (change ideas). Using run charts, we analyzed data each week to identify trends and variances. We used plan-do-study-act cycles and implemented initial interventions centered on publicizing CFF follow-up guidelines in town hall meetings, emails, and newsletters. We later identified PwCF who had a no-show history, and before clinics, our social worker communicated with each family (telephone or text) to remind them of the upcoming visit and identify any barriers to attending. During our study, Oregon experienced a surge in COVID-19 cases from the omicron variant, and we overlaid our data with a graph of cases.

Results: CFR was measured in 598 encounters over 28 weeks. CFR 1 month in advance was 79%. In the week before clinic, CFR was 84%. After the week, overall CFR was 66% (68% for face-to-face visits, 58% for virtual visits). Fifteen percent of our cancellations were COVID-related (increasing to 21% during the surge), but CFR did not change during the surge. After our intervention, those contacted in advance came to clinic 93% of the time, and our CFR improved to 74.8%.

Conclusions: An 84% CFR, measured 1 week ahead of clinic, was dropping to an average of 66% because of late cancellations and no-shows, and widespread education about clinic attendance guidelines did not increase the rate. Having our social worker communicate directly with PwCF increased our CFR closer to our advance numbers, and 93% came to clinic. These communications also served as an additional patient interaction during which other social work needs were identified. Overall reduced clinic attendance may be related to the indirect impact of the pandemic and benefits of modulator therapy. We need to gather more post-implementation data and to consider different approaches to partnering with PwCF to achieve ideal follow-up.

Reference


Calprotectin predicts cystic fibrosis pulmonary exacerbations in equivocal cases

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Background: People with cystic fibrosis (CF) frequently experience pulmonary exacerbations (PEX) characterized by uncontrolled airway infection and inflammation. Without a consensus definition of PEX, clinicians can overlook these events, which can decrease long-term lung function, quality of life, and life expectancy. The decision to treat with antibiotics is straightforward when the patient presents with respiratory symptoms (e.g., cough, mucus, breathlessness) and poor lung function, but adjunctive approaches to PEX diagnosis are needed in equivocal cases, where the clinical course of action is unclear. C-reactive protein (CRP) and calprotectin are promising candidates to aid PEX diagnosis. The objective of this study was to evaluate the utility of CRP and calprotectin to differentiate patients who will eventually require treatment with antibiotics when they present to CF clinic with discordant changes in symptoms and lung function.

Methods: We retrospectively identified patients from the CF Biomarker study at St. Paul’s Hospital (Vancouver, Canada) who presented to the CF clinic with discordant changes in respiratory symptoms and lung function and were not prescribed antibiotics (index visit) between 2012 and 2019. Discordant visits were defined as visits with a Cystic Fibrosis Respiratory Symptom Diary—Chronic Respiratory Infection Symptom Score (CFRSD-CRISS) of 39 or greater and a relative forced expiratory volume in 1 second (FEV1) drop of less than 5% (symptomatic, stable FEV1) or a CFRSD-CRISS score less than 30 and a relative FEV1 drop of more than 10% (silent decline in FEV1). Using biobanked blood samples, we quantified plasma calprotectin levels using an enzyme-linked immunosorbent assay and plasma CRP levels using an electrochemiluminescence assay. We measured the samples in duplicate and used mean values for analysis. We used a generalized estimating equation (GEE) model including age, sex, and baseline percentage predicted FEV1 to examine the association between log2-transformed CRP or calprotectin levels and subsequent risk of PEX requiring antibiotics within 4 months of index visit.

Results: We identified 52 discordant visits (77% symptomatic, stable FEV1) in 36 patients (61% male) with a median age of 28 years [interquartile range (IQR) 25, 38] and a median baseline percentage predicted FEV1 of 80% [IQR 50, 97]. Patients had a range of one to four discordant visits, with 75% having only one discordant visit. The 52 visits had a median CRP concentration of 5.16 mg/L [IQR 2.15, 10.58 mg/L] and a median calprotectin concentration of 0.81 mg/L [IQR 0.62, 1.71 mg/L]. In our adjusted GEE model, there was no association between log CRP levels and PEX requiring antibiotics within 4 months of the index visit (OR = 1.10, 95% CI, 0.77–1.57), although we found a significant association between log calprotectin and PEX requiring antibiotics (OR = 2.51, 95% CI, 1.08–5.80).

Conclusions: The independent association between calprotectin and risk of PEX in our cohort in the presence of other important covariates demonstrates calprotectin’s potential value as a biomarker of PEX in discordant cases. Use of calprotectin as an objective add-on test could help improve PEX diagnosis and facilitate timelier treatment. Validation in an external cohort is in progress; diagnostic cut-offs will need to be defined.