The Use Of A BlackBerry® Smartphone For Secure Recording And Transmission Of Daily Respiratory Symptom Diaries By COPD Patients

N. Johnston1, A. McIvor2, M. Gerhardsson de Verdier3, J. Lewis4, P. Newbold5, M. Jenkins6, T. Higenbottam7, J. Legierski8

Methods

Conclusions

Detection of Exacerbations

Approximately half of COPD exacerbations occurring in prospective studies that rely on patients to contact study staff, are not detected at incidence. We wished to determine if COPD patients would use BlackBerry smartphones for daily respiratory symptom reporting and the rates of COPD exacerbations/patient year that could be detected using this approach.

A community based cohort study was initiated December 1 2007 of 50 GOLD stage 1 to 4 COPD patients (23M, 27F age 67.9 + 9.8yrs [mean + SD], FEV1 1.3L + 0.5). Patients were provided with BlackBerry smartphones enabling completed daily symptom diaries to be securely transmitted to a study centre. A track wheel controlled all data entry and no keyboard use was required. Staff were alerted automatically when significant symptom changes, missed diary transmissions or medical care for a respiratory problem occurred. Patient encounters were initiated if COPD exacerbations or respiratory infections were suspected. An additional 30 patients (16M, 14F age 66.7 + 11.5, FEV1 1.3 L + 0.5) joined the study December 1st 2008. Data collection continued until April 30th 2009. Exacerbation length was calculated as days from first cold symptoms or if none, encounter and return to normal breathing. Severity of exacerbations (Anthonisen) was blindly assessed.

Overall, patients transmitted all but 26 of 27408 possible daily diaries. 26,287 of 27,408 (95.9%) were transmitted by patients themselves with a further 1,095 (4.0%) entered by staff on patients’ behalf. Patients experienced a total of 191 in-patient hospital days with diaries completed on 176 (92%).

192 COPD patient encounters were initiated of which 191 (2.5/patient year) were determined to be for COPD exacerbations meeting Anthonisen' criteria (101 type 1, 57 type 2, 33 type 3). No exacerbations were undetected. During 148/191 exacerbations (78%) patients were hospitalized and/or ordered oral prednisone, an antibiotic or both, (1.97/patient year). The distribution and characteristics of exacerbations are shown in the figure below. In 78 of 191 (41%) of exacerbations one or more viruses were detected.

We have shown that COPD patients, most of them elderly, will submit daily respiratory symptom and other health information over extended periods of time using BlackBerrys. While this may open new approaches to measurement in clinical studies it may also portend the ability to efficiently monitor COPD patients who may be at high risk in regular clinical practice.

Demographic and Clinical Characteristics of the Study Population

Rationale

Methods

Conclusions

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Compliance with BlackBerry Use

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