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Abstracts' Service

Estimating asthma control questionnaire (ACQ) scores from claims data

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Background. Asthma control is the main focus of treatment guidelines. Valid instruments such as the Asthma Control Questionnaire (ACQ) require prospective survey. These surveys may be challenging for large population health applications.
Objective. To develop an algorithm for estimating ACQ-5 scores from commonly available claims data.
Methods. Data was derived from four prospective surveys including the ACQ-5 combined with retrospective claims of Kaiser Permanente of Colorado (KPCO) patients. The statistical approach consisted of derivation and validation of a prediction algorithm including medical and pharmacy claims data using stepwise regression elimination. Validation was conducted by estimating mean squared error (MSE) and mean absolute error (MAE) in one hundred split-sample iterations. Ordinary least squares (OLS), Tobit and Median regression were used.
Results. There were 2,657 individuals with valid ACQ-5 scores, claims and eligibility at baseline. The following had statistically significant associations with ACQ-5 scores: gender, use of oral corticosteroids and short-acting beta agonists, the number of asthma drug classes, and emergency and outpatient visits. Average MSE and MAE were similar for the estimation and validation samples.
Conclusion. This research provides preliminary results of the feasibility of predicting ACQ-5 scores using commonly available medical and pharmacy claims data. The resulting algorithm may facilitate public health and population level analyses of asthma control. Future studies in different populations will be important to validate the algorithm.

Bronchial artery embolization in treatment of hemoptysis: Treatment efficacy and complications at a tertiary care chest centre

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Background. Hemoptysis is one of the most alarming condition to both the patients suffering from it and the treating physicians. It is caused due to varied etiologies. One of the emergent and at times life-saving treatment option is by minimally invasive interventional radiological technique of Bronchial Atery Embolization (BAE). The authors aimed to carry out a retrospective analysis of short term efficacy and safety of all patients treated by this technique at a tertiary care thoracic centre.
Methods. A total of 52 patients were included in the study who had a median follow up of 35 days. All these patients were referred for hemoptysis, intractable hemoptysis not controlled by conservative management or massive hemoptysis. An analysis of the underlying etiology, immediate and short term outcomes and complications was made.
Results. The study showed tuberculosis and its sequel (bronchiectasis and chronic fibrotic changes) as the commonest etiology (65%). The BAE showed high short term efficacy (92%) in stopping the hemoptysis with a relatively low complication rate especially of major complications such as spinal cord ischemia (1.9%). The study strengthens the limited Indian data available on the subject and based on its outcome, BAE should be tried in all patients presenting with uncontrollable or massive hemoptysis not getting relief by conservative management alone.
Conclusion. BAE is a very effective procedure with very less complications for management of massive or uncontrollable hemoptysis.

Shared decision making and time to exacerbation in children with asthma

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Objective. Although shared decision making (SDM) is a promising approach for improving outcomes for patients with chronic diseases, no evidence currently supports the use of SDM to delay asthma exacerbations. We evaluated the impact of an SDM intervention implemented by providers in a real-world setting on time to exacerbation in children with asthma.

Methods. This study used a prospective cohort observed between 2011 and 2013 at five primary care practices that serve vulnerable populations (e.g., Medicaid and uninsured patients) in Charlotte, NC. Patients aged 2 to 17 receiving SDM were matched to those receiving usual care using propensity scores. Time to asthma exacerbation (asthma hospitalization, emergency department visit or oral steroid prescription in the outpatient setting) was compared between groups using Kaplan–Meier curves and conditional Cox proportional hazards models.

Results. The cohort included 746 children, 60.5% male and 54.2% African American, with a mean age of 8.6 years. Of these, 625 received usual care and 121 received SDM. The final analysis included 100 matched pairs of children. Kaplan–Meier curves showed longer exacerbation-free time for patients in the SDM intervention compared to those in usual care ($p = 0.005$). The difference in risk of experiencing an exacerbation was marginally significant between the two groups (HR = 0.56, 95% C.I. = 0.29–1.08, $p = 0.08$).

Conclusions. SDM was found to delay exacerbations among children with asthma. Clinicians should consider incorporating patient preferences in treatment decisions through SDM as a means for longer exacerbation-free time among children with poor asthma control.

Outbreak of *Prototheca wickerhamii* algaemia and sepsis in a tertiary care chemotherapy oncology unit

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Background. *Prototheca* is an emerging, opportunistic, pathogenic, zoonotic achlorophyllous green alga, expanding in pathogenicity and host range, causing localized and disseminated infections. This outbreak of *Prototheca wickerhamii* algaemia and sepsis in a tertiary care 30-bedded chemotherapy oncology unit is the first human outbreak to the best of our knowledge.

Methods. *P. wickerhamii* algaemia was confirmed on consecutive isolation. Person to person transmission was hypothesized considering all patients in the unit at risk. Clinico-demographic, diagnostic and treatment profile were correlated. Both manual and automated systems were used for blood culture, isolation, identification and susceptibility of *Prototheca*. Liposomal amphotericin B was given. Outbreak surveillance of faeces, fingertips and environmental reservoirs, retrospective surveillance during past 15 years and prospective surveillance was continued for two years.

Results. The outbreak affected 12 neutropenic patients over 50 days. No specific clinical features were noted. The hypothesis could not be substantiated. *P. wickerhamii* was isolated as yeast-like colonies revealing Gram positive yeast-like cells without budding and pseudohyphae which were confirmed by automated system. Post amphotericin B blood cultures were negative for *Prototheca*. Surveillance studies were not contributory.

Conclusion. *P. wickerhamii* has no documented reservoirs or transmission. Endogenous colonization in the gut followed by translocation during chemotherapy induced immunosuppression is likely to cause algaemia and sepsis. Outbreaks are difficult to detect and control as incubation period is variable and clinical presentation is muted, emphasizing the need to strengthen hospital and laboratory based surveillance systems to ensure adequate preparedness, rapid detection and response to outbreaks.

Trastuzumab Emtansine for Residual Invasive HER2-Positive Breast Cancer

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Background. Patients who have residual invasive breast cancer after receiving neoadjuvant chemotherapy plus human epidermal growth factor receptor 2 (HER2)–targeted therapy have a worse prognosis than those who have no residual cancer. Trastuzumab emtansine (T-DM1), an antibody–drug conjugate of trastuzumab and the cytotoxic agent emtansine (DM1), a maytansine derivative and microtubule inhibitor, provides benefit in patients with metastatic breast cancer that was previously treated with chemotherapy plus HER2-targeted therapy.

Methods. We conducted a phase 3, open-label trial involving patients with HER2-positive early breast cancer who were found to have residual invasive disease in the breast or axilla at surgery after receiving neoadjuvant therapy containing a taxane (with or without anthracycline) and trastuzumab. Patients were randomly assigned to receive adjuvant T-DM1 or trastuzumab for 14 cycles. The primary end point was invasive disease–free survival (defined as freedom from ipsilateral invasive breast tumor recurrence, ipsilateral locoregional invasive breast cancer recurrence, contralateral invasive breast cancer, distant recurrence, or death from any cause).

Results. At the interim analysis, among 1486 randomly assigned patients (743 in the T-DM1 group and 743 in the trastuzumab group), invasive disease or death had occurred in 91 patients in the T-DM1 group (12.2%) and 165 patients in the trastuzumab group (22.2%). The estimated percentage of patients who were free of invasive disease at 3 years was 88.3% in the T-DM1 group and 77.0% in the trastuzumab group. Invasive disease–free survival was significantly higher in the T-DM1 group than in the trastuzumab group (hazard ratio for invasive disease or death, 0.50; 95% confidence interval, 0.39 to 0.64; P<0.001). Distant recurrence as the first invasive-disease event occurred in 10.5% of patients in the T-DM1 group and 15.9% of those in the trastuzumab group. The safety data were consistent with the known safety profile of T-DM1, with more adverse events associated with T-DM1 than with trastuzumab alone.

Conclusions. Among patients with HER2-positive early breast cancer who had residual invasive disease after completion of neoadjuvant therapy, the risk of recurrence of invasive breast cancer or death was 50% lower with adjuvant T-DM1 than with trastuzumab alone. (Funded by F. Hoffmann–La Roche/Genentech; KATHERINE ClinicalTrials.gov number, NCT01772472.)