Utilizing Short-Term Medical Missions to Create Sustainable Asthma Care in Underserved Populations

Alyssa Bray DNP, RN, Brittany Schoen DNP, RN & Taylor Ingram DNP, RN

**Project Purpose**
- For the underserved population in rural Honduras
- Develop an asthma education & action plan for sustainable asthma care based on available resources.
- Identify self-reported symptoms & physical exam findings predictive of a positive asthma diagnosis by portable spirometry.

**Problem**
- Lack of appropriate asthma diagnoses, education & treatment facilities associated with poor health outcomes.
- In rural Honduras, most individuals report symptoms suggestive of asthma making a presumptive diagnosis unreliable.
- Population-specific predictors of an asthma diagnosis would be beneficial in diagnosis & treatment when spirometry is unavailable.
- Sustainable asthma care in this population requires creative solutions.

**Quality Implementation Framework**

**Methodology**
- Medical clinics were conducted in 8 villages over the span of 2 weeks in the department of Copan, Honduras.
  - Providers completed a checklist of self-reported symptoms, living conditions & physical exam findings in individuals ≥ 5 years of age.
  - Individuals with ≥ 2 positive responses were tested for asthma using EasyOne portable spirometry.
- Individuals with a positive asthma diagnosis received standard of care asthma treatment & a patient specific asthma education plan.
- As part of sustainable care, pastors of each village were given a nebulizer, saline, and salbutamol solution & were educated on their use.
- A retrospective review of symptom & physical exam findings & spirometry data was conducted using multivariable logistic regression.

**Sample Size**

<table>
<thead>
<tr>
<th>Sample Size</th>
<th>Post-bronchodilator spirometry - Positive asthma diagnosis, n= 17, 18%</th>
<th>Post-bronchodilator spirometry - NO asthma, n=38, 39%</th>
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<tbody>
<tr>
<td>Received Spirometry Testing</td>
<td>n=79</td>
<td>Did not meet criteria for post-bronchodilator spirometry, n=41, 43%</td>
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Several who did not qualify for post-bronchodilator testing were suspected to have COPD.

**Results**
- No self-reported symptoms, including report of previous asthma diagnosis met statistical significance.
- Physical exam findings were more predictive of a spirometry confirmed asthma diagnosis than self-reported symptoms:
  - Dyspnea (p < 0.05)
  - Oxygen saturation of < 90% by pulse oximetry (p < 0.05)
  - Diminished breath sounds (p < 0.1)
  - Cough (p < 0.1)

**Implications**
- Diagnosis in this population:
  - Asthma & COPD symptom similarity increase potential for misdiagnosis.
  - Lack of spirometry testing, provider inaccuracy, or patient misreporting may result in over diagnosis of asthma.
- A self-reported asthma diagnosis or symptoms are not reliable predictors of a spirometry confirmed asthma diagnosis.
- Physical exam findings may be more predictive than self-reported symptoms because asthma is frequently untreated resulting in increased severity and living conditions contribute to asthma suggestive respiratory symptoms (i.e., cough) in most of the population.
- Bronchodilator treatment may be needed before obtaining baseline spirometry.
- Education & treatment in this population:
  - For effective asthma action plans and health care sustainability, nebulizer devices and medication should be available in each village.
  - There is a strong need for education on ventilation systems and the importance of keeping smoke outside the home.
  - Additional data collection over a longer period is needed to assess patient outcomes following implementation of individualized asthma education plans.

**Limitations**
- The severity of patient presentation may have impeded the improvement in post-bronchodilator spirometry resulting in a false negative asthma diagnosis in some individuals.
- Patients had difficulty performing the spirometry testing.

**Asthma Action Plan**
- All 17 individuals with a positive asthma diagnosis received an individualized asthma education plan.
- Nebulizers, saline & salbutamol solution were left in 7 villages with a pastor trained in their use.

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