Prevalence of Asthma at a School-Based Clinic in Nicaragua

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Background: Worldwide, 235 million people have been diagnosed with asthma (World Health Organization [WHO], 2017). The International Study of Asthma and Allergies in Childhood (ISAAC) found the burden of asthma, rhinitis, and eczema are increasing globally (Mallol et al., 2013). The study found the prevalence rate among adolescents (13-14 years) was 14.1% and children (6-7 years) was 11.7% (Mallol et al., 2013). In Nicaragua, the asthma rate for children 13-14 years of age was 15.2% (Mallol et al., 2010).

In 2007, the Nicaragua project was established between the Yale School of Nursing and a school-based clinic in Managua, Nicaragua. The collaboration was developed with the help of The Counsel of Protestant Churches in Nicaragua (CEPAD). A group of Pediatric Nurse Practitioners and nursing students travel to Managua each spring to provide primary care to the children at the school.

Purpose: The purpose of this study was to determine the prevalence of asthma at this school-based health center in Managua, Nicaragua, determine treatment type, and provide recommendations for diagnosis, treatment, and preventive measures.

Methods: A retrospective chart review was performed on all pediatric patient’s medical records seen in the clinic during a five-day period. This study was exempt from institutional review board approval at the university.

Results: The number of patients included in this chart review were 105 with one excluded due to incomplete information. A total of twenty-three patients (21.9%) had asthma documents in the medical chart and were included in the analysis. The average age of the patients with asthma was 7.43 with a range of 30 months to 15 years of age including 13 (56.6%) males and 10 (43.4%) females. Of the 23 patients, 3 (13%) patients were classified with intermittent asthma while the rest of patients (87%) were not classified. Albuterol was prescribed for 19 (86%) of the patients with 2 patients had both albuterol and QVAR® prescribed. Six (26%) patients had a family history of asthma. Approximately, 43% (10) of the households had a parent or family member that smoked in the home, 30% (7) had outdoor plumbing, 17% (4) cooked with open fire, 9 (39%) used combination of fire and gas, and 43% (10) had either a cat or dog or both in the house.

Discussion: This study demonstrated the prevalence of asthma in school-aged children in Nicaragua is significant. The lack of classification of asthma prevents the patients from potentially being treated appropriately. Studies have found the cost of uncontrolled asthma is significantly more than for patients with well controlled asthma (Gold et al., 2014; Neffen et al., 2010; Sullivan et al., 2007).

Conclusion: Nicaragua is the second poorest country in Latin America and poorest in Central America. Continuing to provide care to the patients at the clinic on an annual basis and include classification, access to medication, and education is an upmost importance. Work needs to continue with our partners in Nicaragua to ensure the patients receive the access to care, essential medication, and the education needed to control their asthma.

Reference
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Background
• The global burden of asthma is estimated to be 235-334 million people worldwide have been diagnosed with asthma (Asher & Pearce, 2014; World Health Organization [WHO], 2017).
• The International Study of Asthma and Allergies in Childhood (ISAAC) found the burden of asthma, rhinitis, and eczema are increasing globally with a prevalence rate among adolescents (13-14 years) was 14.1% and children (6-7 years) was 11.7% (Mallol et al., 2013).
• In Nicaragua, the asthma rate for adolescents was 15.2% (Mallol et al., 2010).
• In 2007, the Nicaragua project was established between the Yale School of Nursing and a school-based clinic in Managua, Nicaragua.
• A group of Pediatric Nurse Practitioners and nursing students travel to Managua each spring to provide primary care to the children at the school.

Purpose and Outcomes
• The purpose of this study was to determine the prevalence of asthma at this school-based health center in Managua, Nicaragua, determine treatment type, associated symptoms or diseases, exposure to environmental allergens, animal exposure, and hospitalization rates.
• The planned outcome was to provide recommendations for diagnosis, treatment, and preventive measures with the goal of optimizing asthma management based on the international asthma guidelines.

Methods
• A retrospective chart review was performed on all pediatric patient’s medical records seen in the school-based clinic for either well child care or urgent visit during a five-day period.
• Children with incomplete information were excluded from this review.

Results

| Description of School-Based Health Clinic (n=105) |
|---------|-----------------|
| Age/Year (Median Age) | 8 (6-12 months - 15 years) |
| Gender |       |
| Male | 41 (46.6%) |
| Female | 62 (66.6%) |
| Ethnicity/Race |       |
| Latino | 59 (56.6%) |
| Other | 46 (43.4%) |
| History of Pneumonia | 23 (21.9%) |
| History of Asthma | 14 (13.1%) |
| History of Asthma | 7 (6.7%) |
| History of Pre-existing Asthma | 7 (6.7%) |
| Exposure to Cigarette Smoke | 52 (48.5%) |
| Allergic Reaction to Substance | 66 (62.1%) |
| Cooking Source: Wood stove/Charcoal | 55 (52.4%) |
| Animals in Home: Cat/Gift | 64 (60.4%) |
| Floor Type: Wood/Tile/Wood/Earth | 42 (39.6%) |
| Family History of Asthma | 25 (23.3%) |

SBHC in Managua, Nicaragua  Classification of Asthma

Diagnosed with Asthma
22%  No History of Asthma
78%

Not Classified
87%

Diagnosed with Asthma
22%

Classification of Asthma

Intermittent
1%

• Of the 105 students, 23 had a provider diagnosis of asthma.
• Only 13% were classified as intermittent asthma, 87% had no classification.
• 30.4% had a family history of asthma.
• 19 patients had a script for Albuterol and 2 patients had Albuterol and QVAR
• 43% have been hospitalized with asthma
• Environmental exposure to animals (dog/cat) 43.5%, cigarette smoke 43.5%, cooking with fire/wood/charcoal 56.5%

Discussion
• This study demonstrated the prevalence of asthma in school-aged children in Nicaragua is significant.
• The lack of classification of asthma prevents the patients from potentially being treated appropriately.
• Studies have found the cost of uncontrolled asthma is significantly more than for patients with well controlled asthma.

Conclusions
• Nicaragua is the second poorest country in Latin America and poorest in Central America. Continuing to provide care to the patients at the clinic on an annual basis and include classification, access to medication, and education is an upmost importance.
• Work needs to continue with our partners in Nicaragua to ensure the patients receive the access to care, essential medication, and the education needed to control their asthma.