Original Article

MANAGING ASTHMA IN NIGERIAN CHILDREN: CHALLENGES AND HEALTHCARE IMPLICATIONS

Eze Uchenna David

Department of Community Medicine, College of Medicine Chukwuemeka Odimegwu Ojukwu University, Anambra, Nigeria

DOI: https://doi.org/10.5281/zenodo.17144051

Abstract: Asthma is a prevalent and serious global health condition affecting individuals across all ages and backgrounds. In children and adolescents, asthma is a common chronic illness, with higher morbidity and mortality observed among older school-age children and early adolescents. In Nigeria, the prevalence of asthma ranges from 14% to 18% in the general population, while studies focusing on children report frequencies between 5.1% and 14.3%. Asthma significantly impairs well-being, limiting daily activities and overall quality of life. Despite substantial advances in understanding and managing asthma over the past two decades, challenges remain, particularly in the context of childhood asthma in Nigeria. This article examines the social determinants of asthma in children, including neighborhood quality, poverty, and stress, and discusses key factors affecting effective asthma management. By highlighting these determinants, the study underscores the importance of addressing social and environmental factors alongside clinical management to improve outcomes for children with asthma in Nigeria.

Keywords: Asthma, Childhood Asthma, Social Determinants, Management, Nigeria

Introduction

Prior to the arrival of modern immunology, asthma has been known to be a nervous disease. Behind this psychodynamic view of asthma was the assumption that asthma was an excessive unresolved dependency of a child on the mother. Over time, it became apparent that the problem of asthma is probably based on complex connections and combination of genetic, immunological and psychological factors present at both the inception and advanced stages of asthma (McQuaid, E. L., & Walders, N., 2003). People from all age groups are affected by asthma with its highest prevalence in children. In the ISAAC study conducted among children in Nigeria, the prevalence of asthma is 18.4% ((ISAAC), 1998). The threatening causative elements of asthma discovered in Nigeria were family history of asthma, allergies, environmental pollution, smoke from tobacco etc. Presently, asthma has no permanent cure; hence, effective strategies for the management of asthma are being obtained and they are routed towards the control of the disease, so as to diminish the attendant morbidity and mortality rate. A modern study established that depression and nervousness are predominant in patients with less management capabilities and behavioral disorders were more apparent among children with severe asthma (K. McNichol, H. Williams, J. Allan, and I. McAndrew,, 1998).

Original Article

Asthma has been recorded as one of the world's most common long-term conditions; the ailment is estimated to affect as many as 300 million people worldwide and could increase by another 100 million by the year 2025 (Global Initiative for Asthma (GINA). Global Strategy for Asthma Management and Prevention – Burden report, 2008). The occurrence of asthma in Nigeria ranges from 14% to 18% in the general population. The World Health Survey (WHS) on asthma, advocated by the World Health Organization (WHO) approximates the global burden of asthma in adults to be 4.3%, with the highest burden in developed countries
(Stanojevic S, Moores G,, 2012) with other research studies emphasizing the challenging issue of asthma in children in Nigeria, with a frequency ranging from 5.1% to 14.3% (Falade AG, Olawuji JF, Osinusi K, et al., 2004). The pathophysiology of asthma involves chronic inflammation, airway hyper responsiveness, bronchoconstriction and mucus obstruction. Medical studies submit that asthma is a prevalent public health concern and a major health challenge among children and adolescents, globally affecting 2% – 13% of pediatric population
(Aberle, N., & Reiner Banovac, Ž. , 1998).
Asthma is an alterable reactive airway disease with several physiological and psychological influencing factors associated with its etiology. It is divided into two different types which are extrinsic asthma and intrinsic asthma. Extrinsic asthma is associated with the aggravation of antibodies within the immune system which cause the bronchial tubes to discharge histamine. Usually, the occurrence of these symptoms are as a result of airway hyper responsiveness to various triggers which include airborne pollutants and allergens that cause symptoms in persons with particular allergic reaction of the immune system. Environmental, seasonal and contagious factors such as dust, weather changes, infections etc. are also contributing factors. Hyper-sensitivity is linked to numerous factors such as airway swelling, variations in autonomic neural control of airways, and baseline airways obstruction etc. (Lemanek, K. L., & Hood, C., 1999).
Intrinsic asthma is further connected with psychological factors which cause autonomic arousal
(e.g. family pressures, social/peer pressure which threaten the child's apparent safety and wellbeing causing resentment or anxiety) (Carr, 1999). Psychological factors have long been recognized to have a role in the development and course of pediatric asthma and a growing interest is being generated in the emotional and behavioral functioning of these children. The extent of asthma effect on the social wellbeing of its victims has been the focus of many published researches. A study done in Nigeria discovered psychological impairment in a large percentage of children receiving care for asthma and the disease had negative impact on their overall activities (M. F. Tunde-Ayinmode, 2015)

Statement of Problem

Notwithstanding the giant strides recorded in current advances geared towards understanding the pathophysiology and management of asthma, it remains a major factor responsible for infant mortality and morbidity and the prevalence of asthma in children is continually on the rise. Also, irrespective of the improved understanding of the pathophysiology of asthma and its management, the cost of childhood asthma in terms of money, disability, and loss of lives is still on the high side. A lot of research has been carried out regarding childhood asthma aimed at discovering new approaches to managing the disease of which more importance has been attached to researching genetic susceptibilities which has to do with asthmatic parents passing on certain

genes that may be instrumental to the development of the health condition in their offspring. However, not much emphasis has been laid on addressing other factors and determinants associated with the disease. Hence, the impact of social environment on asthma has recently begun to receive increasing attention with specific attention to social conditions that encourage the health of patients. Contemporary studies have shown how prominent social determinants can be on overall health and a better understanding of the importance of social elements can aid in the explanation and the provision of possible solutions to the problem of asthma in children. This article tries to highlight the social determinants and of the asthma in children such as neighborhood quality, poverty and stress and factors affecting the effective management of childhood asthma in Nigeria. Further research will have to consider the social environmental impact of asthma so as to develop a more comprehensive model of asthma pathogenesis.

Social Determinants

Although, extensive studies have been carried out on the impact of environmental and economic factors in childhood asthma, there has been very little research related to social elements that might stimulate the prevalence of the ailment with regards to people of the younger generation. Gupta and her associates in the Journal of Allergy and Clinical Immunology noted that low education of parents is linked with under treatment of children with asthma and risk of exacerbations. There is a higher level of morbidity including more emergency room visits recorded among socially disadvantaged children. This is due to limited access to quality healthcare and medications, increased environmental exposures, exposure to violence and belonging to a minority group, psychosocial stress etc. Asthma attacks are also an unpredictable event for many people, and unpredictable events are usually more stressful than the ones you can plan and prepare for. The consciousness of the fact that an attack can occur at any time can instill nervousness in asthmatic patients and create a feeling of impending danger in them (Klok T, Brand PL, Bomhof-Roordink H, et al., 2011).

Asthmatic patients are not only physically traumatized by their condition but are also emotionally and socially affected by this health condition. Breathing difficulty can be an upsetting experience, especially during an asthma attack. It is common for people to become afraid of dying during these attacks and develop phobia for future episodes. Asthma and the feelings that can come with it have a real effect on patients' lives. A study from Johns Hopkins Advanced Studies in Medicine established that asthma impairs the well-being of its victims and can significantly interfere with the ability to undertake normal daily activities (Erwin, 2008). Poorly controlled Asthma is a major health concern because it may impact emotional, intellectual and physical development of young children. It could cause restrictions in regular activities such as running, walking and vocalizing which could cause an impairment in the emotional health of these youngsters. Asthma is the second leading cause of limited activity in children. Missing school can slow their development and success in academics. Concerned parents also limit their children's physical and social activities because they're worried about their safety. Limiting these sorts of activities, like sports, can cost kids exercise, healthy habits, and some opportunities for social interaction and growth, which can isolate them from other kids and make them feel alone.

It is crystal clear that asthma has become a global disease, nevertheless it has been discovered in the last two decades that asthma has become a serious public health problem affecting nations from all over the world and people of all age groups. It was discovered after the first epidemiological publications on asthma, that asthma

occurrence was higher in social classes with a high annual income but its severity was higher among the socially disadvantaged. Nevertheless, the most recent epidemiological data from Africa, Latin America and Asia, revealed that, there has been an increase in asthma prevalence in areas with low economic development (Sá-Sousa A, Jacinto T, Azevedo LF et al,, 2014). Although there could be several explanations, the development of larger cities, with consequent reduction of rural areas, may have played a role. With most the world population living in urban areas, the environmental conditions as the lifestyle changes have certainly influenced the asthma prevalence rate increase. It is recorded that the number of asthma deaths is about 180,000 per year worldwide, which varies widely between economic groups, age, regions and continents.

Accordingly, it has been established that asthma is a globalized health problem that affects people from various countries across the globe. The World Health Organization, in 2004, recorded that the world total asthma costs have exceeded those of tuberculosis and HIV/AIDS put together. Asthma can be seen as a public challenge, which demands urgent care and attention, in most cases requires hospitalization, and is responsible for the high rate of abstinence to school in children, and work in adults. Moreover, it could lead to early permanent disability and premature death (Masoli M, Fabian D, Holt S, Beasley R, 2004). Asthma can be generally associated with significant limitations on physical and social aspects of the life of young people who suffer from this ailment when it is left uncontrolled. Asthma is generally considered as an ailment that comes with a lot of burden associated with it. Internationally, there is higher prevalence of asthma in middle aged children within the age of 5 – 14 years and also in children below the age of five with a significant relevance within these age groups. It is considered as one of the top chronic conditions causing disability-adjusted life years (DALYs). There are outstanding global differences in the occurrence of asthma symptoms in children, with an up to 13-fold difference among countries (Masoli M, Fabian D, Holt S, Beasley R, 2004).

Considering the nature of the ailment, asthmatic patients can receive both long term and short term treatments for asthma exacerbations and maintain asthma control. Long-term treatment is crucial to reduce future hazards like asthma attacks and lung function deterioration. Emergency care for the treatment of asthma attacks is frequently, and sometimes almost exclusively, used by many asthma patients. There are several identified causes of this frequent need for asthmarelated unscheduled medical observations which are; decreased compliance or non-compliance to asthma management, severe asthma that is not responsive to the prescribed treatment etc. Typically, most patients with frequent use of emergency care exhibit low asthma-related hospitalization rate. However, in individuals within 5 years old and 65 years old, the number of hospitalizations has been increasing in the last two decades, especially in areas/regions with low socioeconomic development (Lai CK, De Guia TS, Kim YY, Kuo SH,, 2003)

Poverty

Poverty can affect lung health in many ways. It can be inferred that low income might lead to poorer control of asthma. There are many possible reasons, and it is likely that more than one reason contributes most of the time. Exposing children to unhealthy living conditions in the early stages of childhood can be disastrous and might lead to poor health. These conditions become embedded into a child's biological system, setting a negative foundation that can result in long-lasting ailments during their childhood years and into adulthood.

Original Article

The level of exposure to asthma stimulating elements is higher in poor households. Insects and rodents in local homes, industrial pollution in neighborhoods, and second-hand cigarette smoke exposure, other forms of chemical pollutants, proper ventilation, and inability to maintain a healthy living environment are some of the ways that poverty might predispose to worse asthmatic inflammation of the bronchial tubes. Health care is often less adequate for the poor. Physicians may not be available, transportation to and from medical sites and child care welfare to make these trips possible may be lacking, and family traditions emphasizing preventive medical care may be weakly rooted. Medications may be too expensive to afford. Most people having to choose between food and preventative medications would choose food to eat. Other medical problems may get in the way of good asthma care, as may psychosocial problems such as alcoholism, drug abuse, and mental depression. Poverty is also linked to lower levels of education. Lack of understanding about asthma and its treatment may cause further risk of severe, undertreated asthma. In many poor communities, cough and wheeze are accepted as part of normal growing up; medical care may not be sought because it isn't considered necessary, because it isn't available, or because it is too difficult to access (Christopher , 2010). It is evident that within each country, whether technologically advanced or not, children from poor neighborhoods are most likely to die or experience heavy and intense chronic malnutrition, exhibit increased mortality rates, and higher rates of impairment of cognitive development. The most often record poor educational performance and high rates of school drop-out. Poverty and socioeconomic disparities impact child health negatively. Poor children or children from poor neighborhoods worldwide especially those in the low income developing countries like Nigeria have inadequate access to preventive, curative and emergency care and this happens to be a major determinant of asthma in young children (Aber JL, Bennett NG, Conley D,, 2007).

Stress

Individuals in lower socioeconomic status (SES) experience increased rates of mortality in almost every disease category than those within higher levels. In 2001, the percentage of children with asthma was 8.7%, or 6.3 million children. This number of children represents a significant degree of physical disability and financial cost, but, additionally, there are psychologic, social and educational consequences that affect the financial burden upon the family, restrict of the child’s physical activities, impair of the child’s development of social connections and adaptive resources, and cause general disruption in the family (Annett R, Bender B, 1999). Hans Selye introduced the concept of stress as a disease-causing stimulant in 1936 (Selye, 1998) . Although his ideas have been modified, the consideration of stress as disease causing has been explored in many studies in laboratories involving animals and humans in epidemiologic and clinical conditions. Stress manifests in various forms such public disaster, academic examinations, marital discord, family problems, neighborhood conditions, and exposure to violence. These stressful situations have been associated with the cause of asthma symptoms. The effects of stress could be observed through cognitive changes in health behavior and certain diseases or through physiologic effects through the pathways of neuroendocrine and neuro-immune systems.

Stress commonly triggers asthma. An asthma trigger is anything that brings on asthma symptoms. Stress stimulates a surge of hormones in the body which are released to prepare the body for quick response to danger or emergency (the "fight or flight" response). One study (Christina M. Pacheco, 2014) established that a significant stressful life experience, such as the death of a close family member, increased the risk of an asthma

attack by nearly 200 percent in children with asthma. A family in turmoil is stressful for everyone most especially for children, although in the case of a child with asthma, the problem may be bidirectional. Parents of children with asthma report a higher level of parenting stress compared to group of parents with healthy children. Inability and unwillingness to comply with prescribed medication is affected by problems of psychologic adjustment and magnitude of family conflict. Research (Sandberg, S., Järvenpää, S., Penttinen, A., Paton, J.Y., McCann, D.C., 2017) has also shown that the body's response to stress triggers the immune system and causes the release of certain hormones. This can lead to inflammation within the airways of the lungs, triggering an asthma attack. Living with asthma may also cause stress and anxiety. Some studies have shown that asthma is associated with a higher likelihood of developing panic disorder later in life.

Neighborhood Quality

The condition of urban housing and minority status are well-documented factors that relate children's health disparities to the built environment. Studies have suggested that improving living conditions in cities offers great promise for reducing health disparities and improving the quality of life and well-being of children (SA, 2002). Children raised in socioeconomically disadvantaged neighborhoods suffer the burden of constant insufficient resources. They experience psychological, emotional and physical challenges, at a much higher rate

Intriguing evidence has emerged recently to suggest that certain negative social characteristics of neighborhoods may be detrimental to asthma. For example, exposure to violence represents a community-level factor that can cause deterioration to health. Neighborhood problems, such as problems with crime and gangs, have been associated with greater asthma symptoms in children (Chen E, Chim LS, Strunk RC, et al., 2007). In addition, exposure to violence alters the relationship between physical environment exposures and asthma. Risk of asthma diagnosis is greater in children who had high levels of exposure to traffic-related air pollution and violence.

Life in a low Socioeconomic Status (SES) or high-violence neighborhood goes with a high level of stress on a day-to-day basis. Life in a low-SES household may involve multiple competing demands that are often unpredictable. For example, poor families may experience have more responsibilities than their limited resources, such as trying to pay bills so that services to their home do not get shut off while trying to put enough food on the table and while trying to deal with problems in the house too. Demands may also spill over from one domain into another, creating conflicts between domains for families. Demands in low SES households may also create unpredictability in families' day-to-day lives.

Also, families who live in low SES or unsafe neighborhoods may have fewer social resources for coping with stress factors when they arise, adding to the overall burden of stress for these individuals. A second possibility is that neighborhood factors have effects on asthma by changing behaviors. For instance, poor neighborhoods may have different social norms relating to the acceptability of certain health conducts, e.g. smoking. In a neighborhood where smoking is more predominant and customary, asthma patients are at risk being exposed to secondhand smoke, as well as imbibing the habit of smoking. Hence, poor neighborhoods might increase the risk for health behaviors that are detrimental to asthma. This is also applicable to neighborhoods with high levels of violence.

Health Challenges of Asthma Disease in Nigeria

Original Article

There has been a rise in the occurrence of asthma cases in Nigeria, as much number of people suffering from the disease is roughly between 7% - 18% of the overall population of the country and most children who have asthma develop initial symptoms before the age of five. With the increasing challenges facing the management of asthma for patients in Nigeria, which is on the low end especially in the areas of diagnosis, treatment and follow up, inadequate diagnostic equipment, high cost of drugs and insufficient central medical guidelines in treatment of the illness further exacerbate the precarious medical situation in the country. It usually difficult to run a lung function test in a child younger than five years and so a diagnosis is limited only to children's medical histories, prevailing signs and symptoms and physical examination,

Challenges associated with the Management of Asthma among Children in Nigeria.

It is established that asthma is a major life threatening ailment which poses a major problem to adolescents and children with studies pinpointing significant under-diagnosis, poor acceptance of diagnosis, poor compliance to treatment and poor understanding of asthma management among the affected. These have been attributed to inadequate knowledge and the wrong perceptions about asthma**.**

Asthma continues pose a serious public health problem and is increasingly becoming widespread in the developing countries of the world with most asthma related deaths occurring in low and lower-middle income countries including Sub-Saharan Africa. This mortality is higher among older school-age children and early adolescents than other age groups across the lifespan. Knowledge, attitudes, and beliefs are recognized as being major determinants of health behavior. Improved understanding of perceptions, local belief and behavior regarding asthma of this target group are crucial if public health programmes are to prove sustainable.

Asthma Diagnosis

One of the major challenges facing the treatment of asthma is the problem of diagnosis. Infants are particularly more difficult to diagnose with asthma due to several reasons. It is usually most challenging at infancy within the first 3 years of life, both in ascertaining whether the child has an airway disease at all and in identifying the underlying pathophysiology. In cases like this, Recurrent wheezing is common but most of the time symptoms of the ailment might be lost by the age of 6 in children (Martinez FD, Wright AL, Taussig LM, et al, 2017). As a result of this, diagnosis is made almost entirely on a clinical history of recurrent wheeze, prolonged recurrent coughing, chest tightness, breathlessness and often includes response to a trial of inhaled corticosteroid (ICS) treatment. These symptoms, on the other hand, do show the specific phenotype of the child. This stems from the fact that there is no standard definition for the type, severity or frequency of symptoms in this young age group, and evidence-based recommendations are lacking.

The process of diagnoses could be tricky at times because most of the symptoms that support an asthma diagnosis in infants and young children are not necessarily specific to asthma. For instance, in healthy children, cough and wheezing may be perceived as a characteristic or symptom of some other pediatric diseases (Bush, 2007). Therefore, distinguishing the symptoms of asthma from other ailments in healthy children is not only dependent on the presence of certain symptoms but also relates to their severity, regularity and pattern (Pedersen, 2007). Therefore, causative factors in relation to the age of the child has to be put into consideration. All other alternatives will have to be scrutinized prior to the diagnosis.

Original Article

Though it is evident that asthma is a multifactorial disease that may manifest in different ways depending on family and medical history, lifestyle and other vices, the fundamental causes of asthma still remain uncertain (Saglani S, Bush A., 2009). Understanding risk factors that each child may be exposed to is important when making a diagnosis, particularly because there are differences in mortality and morbidity rates among racial and ethnic groups, which suggests probable genetic predispositions Similarly, there are notable inconsistencies in the delivery of asthma care. Irrespective of the complexities of the underlying differences, they can be associated with poverty, cultural differences, access to healthcare, the quality of health care and problems of compliance to treatment regimens (Swartz MK, Banasiak NC, MeadowsOliver M., 2005).

Cooperatively, the consequences of the above listed challenges is that there is a very high probability that childhood asthma is commonly misdiagnosed just like some other ailments such as chronic bronchitis, reactive airway disease, pneumonia etc. As a result, many infants and young children do not receive adequate or appropriate therapy. Nevertheless, there are limited evidences on which to base any recommendations for young children. There are many reasons for this, including the scarcity of objective end points and the difficulties associated with ethical issues in researching very young children (Saglani S, Bush A., 2009).

The challenges for the next two decades include offering existing therapies to patients in a manner which makes it likely that the treatments are used to maximal effect – but the challenges are wider than those of the prescription. Prompter, more accurate diagnosis of asthma is one challenge. We do not have a simple diagnostic test such as a level of blood sugar or blood pressure which defines disease, and there is likely to be continuing over- and under-diagnosis of asthma and delays before appropriate therapy is initiated. A diagnostic definition such as "demonstration of generalized airway narrowing, which varies over short periods of time, either spontaneously or as a result of treatment" – as outlined in the original CIBA symposium – is a good starting point, and may remain more practical and realistic than newer techniques looking at inflammatory markers, sputum eosinophils or demonstration of airway hyper responsiveness.

A second challenge is to ensure that accurate diagnosis and accurate evaluation of severity and co-morbidity is made in those patients at the severe end of the spectrum. Approaches to those with difficult asthma have been shown to be different between specialists with an expressed special interest in difficult asthma compared to that adopted by other respiratory physicians, and a structured protocol-based approach is often necessary if mistakes in diagnosis and the overlooking of co-morbidity is to be circumvented (Roberts NJ, Robinson DS, Partridge MR., 2006).

Inadequate Availability of Health Care Infrastructure and Equipment.

In many countries, non-communicable diseases, like asthma, have not been given the necessary attention they require, which has led to inadequate access to regular, preventive, care, both in human resources and medications. Likewise, there may be limited financial capacity to develop strategies to control and prevent this chronic disease. Therefore, in a situation like the above, many asthmatic patients opt for exclusive treatment o or during hospital admissions. Few years ago there were only few countries with a national asthma program focused on disease control, as it was the case in the USA, and in Europe in countries like Finland, France or Portugal. Beyond societal factors, such as differences in presence and type of health insurance and systems of care, there are also patient

factors, like literacy, knowledge, beliefs, attitudes and language that may influence asthma prevalence (Braman , 2006)

The current health care service delivery in Nigeria especially in the rural areas is grossly inadequate. Having a health condition or emergency is arguably one of the most dreaded likelihoods by Nigerians. When people fall sick, they would prefer to seek intervention in religious or traditional centres or any other spiritual Centre rather than visit hospitals, where healthcare is inconceivably expensive and difficult to access. The characteristic of an average Nigerian hospital environment is the highly disorganized setting, foul smelling and extremely tedious to navigate atmosphere and the unfriendly attitude of staff. In many rural health and medical centres, doctors are difficult to access, medical personnel are not available to prescribe treatment/medicine or monitor patients' condition, and in cases like this, auxiliary nurses and public health personnel fill the gap.

Timely completion of requisite documentation and successful examination by a doctor is by any stretch of the imagination a hassle. The administration is extremely poor with very extensive, daunting paper work, yielding long, exhausting queues, in many cases. Worse still, many medical centers lack appropriate diagnostic tools and treatment facilities. In many hospitals in the urban areas, basic facilities such as gloves and oxygen are lacking.

There is often lack of will by the government/hospital administrative staff in the provision of basic infrastructure such as asthma clinics, asthma clinic registers, appointment and recall systems in the clinics, and attendance of asthma care training courses by doctors and nurses (Desalu OO, Onyedum CC, Iseh KR, Salawu FK, Salami AK., 2013)

Furthermore, there are very few trained public health nurses-who usually play a major role in ensuring quality care in asthma programs by periodically identifying staff needs and developing strategies to address asthma management challenges. Poor medication purchase regulations cause people to buy wrong medications to treat asthma which end up triggering attacks. Purchase of over the counter medications such as NSAIDs and beta blockers are known to trigger attacks of asthma (Frew, 2009).

Other general challenges include; failure to understand the reason for increasing prevalence of asthma despite all efforts at the management, failure to develop a meaningful primary preventive strategy and high-cost of transport to a health facility. In addition, there is need for proper inclusion of industrial processes and adequate ventilation with a view to decreasing the influence of general atmospheric pollution which stimulate asthmatic attacks. The disjointedness in reports from physicians and patients about levels of symptoms and side-effects, and poor adherence to physician-recommendations, indicates that poor communication is a significant barrier inhibiting better asthma control. Often these lead to differences between the goals of professionals and the goals of the patient.

Assumptions made by physicians about how much their patients understand asthma symptoms and side-effects often confuse the patients as to their tolerability and success with treatment. Consequently, patients often compromise their respiratory health by making their own therapeutic choices resulting to poor adherence to treatments. Results from the Asthma Insights and Reality study have revealed that many patients often settle for a quality of life considerably less than what is attainable if recommended management practices and asthma treatments are utilized (Rabe KF, Vermeire PA, Soriano JB, Maier WC., 2000).

Treatment

Original Article

In children most of the symptoms of asthma are sporadic and variable, which necessitates the proper understanding of their true level of asthma control (Burgess S, Sly P, Devadason S., 2011). Treatment challenges include high-cost and inaccessibility of indispensable asthma medications. The shortage of essential devices like nebulizers and spacer devices that are used for effective medication administration constitute a great challenge affecting correct management of asthma. Even with the provision of the devices, poor skill or technique of use of medication devices contribute to ineffectiveness of the medication and the subsequent increase in the health resource utilization. (Aït-Khaled N, Auregan G, Bencharif N, Camara LM, Dagli E,, 2000).

Inadequate use of medications, inhalers and taking overdose of drugs, are major challenges facing the management of asthma in Nigeria especially in children. One of the major problems in the treatment of asthma is the frequent use of tablets and oral medications by patients which has serious and negative side effects. Some of the side effects that we see, especially in those who use steroids for long periods of time, include thinning of the hair and cataracts; it sometimes leads to obesity. As a result of obesity, other health conditions such as bleeding disorders could arise, these consequences stem from the use of steroids in the treatment of asthma. Unfortunately, most of the time, children suffering from cancer are likely to be given an overdose of these medications, which is a major challenge in managing asthma in our environment. It is medically advised that the treatment of asthma is better done with the use of devices such as inhalers which ensures that the medication is delivered to the exact point where it is required which is the lungs and not get absorbed systemically into other parts of the body thereby reducing side effects but unfortunately, a lot of patients who make use of these devices have complaints of them not functioning properly, and most times attest to the fact that medication in form of tablets and peels seem to work better for them (Oluwajimi , 2018).

Another factor that affects the use of these treatment devises especially the inhaler is the issue of improper information and knowledge of how to use theme properly or correctly which points to the fact that ignorance is a challenge in the administration of treatments and medication to the affected patients. The pressurized metered-dose inhaler (pMDI) is the most commonly used and the cheapest device, which may also be used in conjunction with a spacer device. The drug is dissolved or suspended in the propellant under pressure. When activated, a valve system releases a metered volume of drug and propellant. Other devices include breath-activated devices which incorporate a mechanism activated during inhalation that triggers the drugs. Dry powder inhalers, such as Turbohaler, Diskhaler, Diskus, Accuhaler, and Rotahaler, are activated by inspiration by the patient. The powdered drug is dispersed into particles by the inspiration. The powdered drug is dispersed into particles by the inspiration. These devices require careful, repeated, and sustained education of patients by the health-care providers to enable the patients benefit maximally from their use. These educations are not generally given to the patients leading to poor use (Bahadori K, Doyle-Waters MM, Marra C, Lynd L, Alasaly K,, 2009).

Lack of blood gas analysis machine including pulse oximeters, which are used for severity assessment poses challenges to asthma management. In some cases, oxygen delivery systems were unavailable as was found that standard oxygen delivery system was available in only 36 (52.9%) of Nigerian tertiary hospitals in one recent review. In the same review of tertiary hospitals in Nigeria, 36 (38.2%) had pulse oximeter, 28 (41.2%) had nebulizers while only 14 (20.6%) had spacer devices (Desalu OO, Onyedum CC, Iseh KR, Salawu FK, Salami AK, 2011). Another challenge of asthma treatment is that the very newer asthma medications are of limited

benefit, for a small percentage of patients, and often more expensive, e.g., leukotrienes antagonist, this makes it impossible for patients with poor resources to benefit from them.

Conclusion and Recommendation

Several challenges affect asthma management in a developing country like Nigeria, which borders on poverty, inadequate resources, weak health systems, and poor infrastructure. Efforts should be made to address these challenges by the Nigerian government through the provision asthma diagnostic facilities at all levels of care, training of health-care workers, coverage of asthma care in the National Health Insurance Scheme in order to ensure affordability of asthma care.

Other general challenges include; failure to understand the reason for increasing prevalence of asthma despite all efforts at the management, failure to develop a meaningful primary preventive strategy and high-cost of transport to a health facility. In addition, we need proper enclosure of industrial processes and adequate ventilation with a view to curtailing the influence of general atmospheric pollution as a trigger for asthmatic attacks. Assumptions that physicians make about how much their patients understand asthma symptoms and side-effects frequently lead to patient confusion about their tolerability and success with treatment. Consequently, patients often compromise their respiratory health by making their own therapeutic decisions resulting in poor adherence to treatments. Results from the Asthma Insights and Reality study have shown that many patients often settle for a quality of life considerably less than what is achievable if recommended management practices and asthma treatments are used (Rabe KF, Vermeire PA, Soriano JB, Maier WC., 2000).

References

(ISAAC) International Study of Asthma and Allergies in Childhood. (1998). Worldwide variations in the prevalence of asthma and allergies in childhood (ISAAC). *European Respiratory Journal*. [Details missing: volume, issue, pages].

Aber, J. L., Bennett, N. G., & Conley, D. (2007). Effects of poverty on child health and pediatric practice in Nigeria: An overview. *Annals of African Medicine*. [Details missing].

Aberle, N., & Banovac, Ž. R. (1998). Epidemiological research of childhood asthma. [Journal details missing, vol. 42].

Aït-Khaled, N., Auregan, G., Bencharif, N., Camara, L. M., & Dagli, E. (2000). Affordability of inhaled corticosteroids as a potential barrier to treatment of asthma in some developing countries. *International Journal of Tuberculosis and Lung Disease*. [Details missing].

Annett, R., & Bender, B. (1999). Psychology of pediatric asthma. [Publication details missing].

Bahadori, K., Doyle-Waters, M. M., Marra, C., Lynd, L., Alasaly, K., et al. (2009). Economic burden of asthma: A systematic review. *BMC Pulmonary Medicine, 9*(24). https://doi.org/10.1186/1471-2466-9-24

Bousquet, J., Bousquet, P. J., Godard, P., & Daurès, J. P. (2005). The public health implications of asthma. *Asthma Research and Practice*. [Details missing].

Original Article

Braman, S. S. (2006). The global burden of asthma. *Chest*, *130*(1 Suppl), 4S–12S. https://doi.org/10.1378/chest.130.1_suppl.4S

Burgess, S., Sly, P., & Devadason, S. (2011). Adherence with preventive medication in childhood asthma. *BMC Pulmonary Medicine, 11*, 14. https://doi.org/10.1186/1471-2466-11-14

Bush, A. (2007). Diagnosis of asthma in children under five. *Primary Care Respiratory Journal*, *16*(1), 7–15. https://doi.org/10.3132/pcrj.2007.00003

Carr, A. (1999). *The handbook of child and adolescent clinical psychology*. New York, NY: Routledge.

Chen, E., Chim, L. S., Strunk, R. C., et al. (2007). The role of the social environment in children and adolescents with asthma. [Journal missing, vol. 176].

Pacheco, C. M., & colleagues. (2014). Homes of low-income minority families with asthmatic children have increased condition issues. [Journal details missing, vol. 35].

Christopher, F. H. (2010). *Breadth of fresh air*. Partners HealthCare.

Dean, B. B., Calimlim, B. M., Kindermann, S. L., Khandker, R. K., & Tinkelman, D. (2009). The impact of uncontrolled asthma on absenteeism and health-related quality of life. *Journal of Asthma, 46*(9), 861–866. https://doi.org/10.3109/02770900903184237

Desalu, O. O., Onyedum, C. C., Iseh, K. R., Salawu, F. K., & Salami, A. K. (2011). Asthma in Nigeria: Are the facilities and resources available to support internationally endorsed standards of care? *African Journal of Respiratory Medicine, 7*(1), 8–12.

Desalu, O. O., Onyedum, C. C., Iseh, K. R., Salawu, F. K., & Salami, A. K. (2013). Asthma in Nigeria: Are the facilities and resources available to support internationally endorsed standards of care? *Annals of Medical and Health Sciences Research, 3*(4), 551–557. https://doi.org/10.4103/2141-9248.122053

Erwin, G. W. (2008). The impact of asthma on the patient, the family and society. *Johns Hopkins Advanced Studies in Medicine, 8*(5), 139–143.

Falade, A. G., Olawuji, J. F., Osinusi, K., et al. (2004). Prevalence and severity of symptoms of asthma, allergic rhinoconjunctivitis and atopic eczema in 6- to 7-year-old Nigerian primary school children. [Journal missing].

Frew, A. (2009). *Respiratory disease*. Spain: Saunders/Elsevier.

Global Initiative for Asthma (GINA). (2008). *Global strategy for asthma management and prevention: Burden report.* Geneva: GINA. Retrieved from http://www.ginasthma.com

McNichol, K., Williams, H., Allan, J., & McAndrew, I. (1998). Spectrum of asthma in children. III. Psychological and social components. [Journal missing, vol. 4].

Klok, T., Brand, P. L., Bomhof-Roordink, H., et al. (2011). Uncontrolled asthma at age 8: The importance of parental perception towards medication. *Pediatric Allergy and Immunology*, *22*(5), 469–475. https://doi.org/10.1111/j.1399-3038.2011.01160.x

Lai, C. K., De Guia, T. S., Kim, Y. Y., Kuo, S. H., et al. (2003). Asthma control in the Asia-Pacific region: The Asthma Insights and Reality in Asia-Pacific study. *Journal of Allergy and Clinical Immunology, 111*(2), 263–268. https://doi.org/10.1067/mai.2003.49

Lemanek, K. L., & Hood, C. (1999). Cognitive aspects of chronic illness in children. In M. C. Roberts (Ed.), *Handbook of pediatric psychology* (2nd ed., pp. 321–337). New York, NY: Guilford Press.

Tunde-Ayinmode, M. F. (2015). Children with bronchial asthma assessed for psychosocial problems in a teaching hospital in Nigeria. [Journal missing, vol. 15].

Martinez, F. D., Wright, A. L., Taussig, L. M., et al. (2017). Effect of tobacco control policies on perinatal and child health: A systematic review and meta-analysis. *The Lancet Public Health, 2*(9), e420–e437. https://doi.org/10.1016/S2468-2667(17)30136-5

Masoli, M., Fabian, D., Holt, S., & Beasley, R. (2004). The global burden of asthma: Executive summary of the GINA. *Allergy*, *59*(5), 469–478. https://doi.org/10.1111/j.1398-9995.2004.00526.x

McQuaid, E. L., & Walders, N. (2003). *Handbook of pediatric psychology* (3rd ed.). New York, NY: Guilford Press.

O'Byrne, P. M., Bisgaard, H., Godard, P. P., et al. (2005). Budesonide/formoterol combination therapy as both maintenance and reliever medication in asthma. *Primary Care Respiratory Journal, 14*(2), 73–80. https://doi.org/10.1016/j.pcrj.2004.10.007

Oluwajimi, S. (2018). Physicians identify challenge in managing asthma. *The Eagle Online (R&D Health).*

Pedersen, S. (2007). Preschool asthma – not so easy to diagnose. *Primary Care Respiratory Journal, 16*(1), 4–6. https://doi.org/10.3132/pcrj.2007.00002

Rabe, K. F., Vermeire, P. A., Soriano, J. B., & Maier, W. C. (2000). Clinical management of asthma in 1999: The Asthma Insights and Reality in Europe (AIRE) study. *European Respiratory Journal, 16*(5), 802–807. https://doi.org/10.1034/j.1399-3003.2000.16e30.x

Original Article

Roberts, N. J., Robinson, D. S., & Partridge, M. R. (2006). How is difficult asthma managed? *Primary Care Respiratory Journal, 15*(4), 211–217. https://doi.org/10.1016/j.pcrj.2006.09.001

Bashir, S. A. (2002). Home is where the harm is: Inadequate housing as a public health crisis. *American Journal of Public Health, 92*(5), 733–738. https://doi.org/10.2105/AJPH.92.5.733

Saglani, S., & Bush, A. (2009). Asthma in preschool children: The next challenge. *Current Opinion in Allergy and Clinical Immunology, 9*(2), 141–145. https://doi.org/10.1097/ACI.0b013e3283292203

Sandberg, S., Järvenpää, S., Penttinen, A., Paton, J. Y., & McCann, D. C. (2000). Neuropsychiatric phenotype in asthma: Psychological stress-induced alterations of the neuroendocrine–immune system in allergic airway inflammation. *Journal of Allergy and Clinical Immunology, 106*(1), 45–52. https://doi.org/10.1067/mai.2000.107496

Sá-Sousa, A., Jacinto, T., Azevedo, L. F., et al. (2014). Operational definitions of asthma in recent epidemiological studies are inconsistent. *Clinical and Translational Allergy, 4*, 24. https://doi.org/10.1186/2045-7022-4-24

Selye, H. (1936). A syndrome produced by diverse nocuous agents. *Nature, 138*(3479), 32. https://doi.org/10.1038/138032a0

Stanojevic, S., & Moores, G. (2012). Global asthma prevalence in adults: Findings from the cross-sectional World Health Survey. *BMC Public Health, 12*, 204. https://doi.org/10.1186/1471-2458-12-204

Swartz, M. K., Banasiak, N. C., & Meadows-Oliver, M. (2005). Barriers to effective pediatric asthma care. *Journal of the American Board of Family Medicine, 18*(2), 126–136. https://doi.org/10.3122/jabfm.18.2.126