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Editorial

Asthma care in sub-Saharan Africa: Mind the gap!

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"Closing gaps in asthma care" is the theme for World Asthma Day 2022. Nowhere are the gaps wider between reality and the ideal, than in sub-Saharan Africa in terms of diagnostics, treatment options, and the underpinning evidence for these.

Asthma is the most common chronic disease in children and adolescents globally and one of the most common chronic diseases in adults.[1-3] The World Health Organization (WHO) and others have highlighted asthma as an underappreciated cause of poverty in low- and middle-income countries that hold back economic and social development, erode the health and well-being of those affected, and have a negative impact on families and societies.[4-6] Asthma is a recognized cause of catastrophic health expenditure and a threat to universal health coverage.[7] The WHO succinctly states "*that in children with asthma, poverty aggravates asthma and asthma aggravates poverty.*"[8] Children miss out on education, adults lose days at work and the costs of medicines, emergency visits, and hospitalization are major financial burdens not only for individuals and their families but also for struggling health systems.[4-8]

Asthma prevalence has been increasing across Africa: In 1990, about 11.7% (74 million including 34.1 million children) of the population had asthma; by 2010, this had increased to 12.8% (119 million including 49.7 million children).[9] Despite the high prevalence, there are limited data about the burden and determinants of asthma in sub-Saharan Africa.[10,11] Asthma morbidity in sub-Saharan Africa today is further compounded by myths and stigma; however, a positive lesson of history from high-income counties is that these can be overcome.[12-14]

Asthma is underdiagnosed and undertreated in sub-Saharan Africa, and consequently, the burden of severe asthma symptoms and mortality rates are disproportionately high, for example, the Ugandan asthma mortality rate of 19 deaths per 1000 person-years is 90 times that of the UK: [15]

In Uganda, a low-income sub-Saharan African country, only 33% of a cohort of people with asthma had controlled asthma, 33% were taking inhaled controller medications, and 60% had ≥1 exacerbations a year.[15] In under 5-year-old children with asthma symptoms, over 90% were diagnosed with pneumonia and treated with antibiotics, thus missing opportunities to address the true underlying issues.[16]

In Kenya, a low middle-income sub-Saharan African country, studies of children and adults with asthma have reported a reluctance to admit to a diagnosis of asthma, even within families. Only about 60% of people with asthma have asthma medication in the home and this is usually limited to salbutamol or prednisolone, with inhaled treatment only deemed necessary for those with the most severe disease. There is generally a preference for oral medications and a fear of inhaled medications (especially inhaled corticosteroids [ICS]).[17,18]

In South Africa, a high-middle-income sub-Saharan African country, only 31.5% of children with asthma had well controlled asthma and 17.6% had been admitted to hospital in the previous year.[19] The prevalence of asthma in adolescents has been reported at 17% and in children in more rural settings and 21% in urban settings.[1,20] The prevalence of doctor diagnosis of asthma was 16.6%, but more than 50% of these children exhibited severe asthma symptoms.[21] The majority of symptomatic children were over-reliant on "as required" short-acting β-agonist 81.2% and only 17% of asthmatics were on regular ICS.[21]

The inevitable consequence of poorly controlled asthma is greatly increased morbidity, with the disability weight for controlled asthma increasing from 0.009 to 0.132 for uncontrolled asthma.[22]

Not only is the need for acute health services for asthma in sub-Saharan Africa high but there is also an underappreciated need for outpatient services. In a cross-sectional survey of 519 adults with chronic respiratory symptoms (>8 weeks) attending hospital clinics in Kenya, Ethiopia, and Sudan (in whom TB had been excluded), the most common clinician diagnosis was of asthma (34%) but the prevalence of wheeze in the past 12 months suggestive of asthma was much higher (71%).[23] There was also evidence of under-reporting of asthma by patients, with 29% of those with a clinician diagnosis of asthma denying they had asthma.[23]

In high-income countries, accurate diagnosis, appropriate treatment, and long-term follow-up, especially if implemented within a national asthma strategy, have been shown to markedly and cost effectively reduce asthma mortality, hospital asthma admissions, and asthma-related disability.[24] Safe and effective inhaled asthma treatments were developed half a century ago but the majority of children, adolescents, and adults with asthma in sub-Saharan African countries have yet to benefit, leading to ongoing preventable morbidity and mortality. This is largely attributable to lack of cost-effective and quality assured medications for asthmatics, with people with asthma having to pay out-of-pocket costs for medication due to lack of universal health coverage.[25-28] In Uganda, for instance, only 4.4% of public hospitals had ICS and none had combination inhalers, for example, budesonide-formoterol that costs the equivalent of 17 days' wages for 1 month supply.[28]

An important principle of asthma treatment is the stepwise approach whereby treatment is stepped up and down in response to asthma control and exacerbation risk.[29] Until recently, international asthma treatment approaches started with reliever medication (e.g., inhaled salbutamol) used "as required" at the lowest step with the addition of regular preventer medication, for example, ICS and other therapies including long-acting β2 agonists (LABA) at higher steps.[29] However, patients with, so called, mild asthma on reliever medication only are still at risk of severe exacerbation (and death).[29] Over the past decade, a considerable body of clinical trial and clinical practice evidence has emerged supporting the efficacy and safety of combination inhalers containing an ICS and a rapid-onset LABA for maintenance and reliever therapy in adolescents and adults.[30-32] In addition, the recent SYGMA 1&2, PRACTICAL, and NOVEL START trials have demonstrated the value of "as required" budesonide-formoterol in patients with mild asthma in reducing morbidity.[33-36] Consequently, single ICS-formoterol therapy from the outset of treatment initiation is now being used in high-income countries and the most recent Global Initiative for Asthma (GINA) guidelines recommend that the minimum treatment for asthma in adolescents and adults is either combined ICS-formoterol as reliever therapy or ICS whenever SABA is taken.[29]

In marked contrast to the rich clinical trial data from high-income countries, there is a fundamental lack of clinical trial evidence to inform clinical care or policy and decision-making for people with asthma in sub-Saharan Africa. While there is undoubtedly scope to translate some of the findings from trials conducted in high-income countries to sub-Saharan Africa, to do so without any major clinical and cost-effectiveness trials focused on the people in sub-Saharan Africa run the risks of overinterpretation as well as a failure to adequately respect and take into consideration factors such as environment, genetics, diversity, culture, traditions, and history.

There are, thus, major gaps in the clinical trial evidence relating to the clinical and cost-effectiveness of ICS-formoterol as required, this is a major road block to informing clinical care and policy- and decision-making in sub-Saharan Africa meaning that children, adolescents, and adults with asthma do not benefit and cannot even step across the gap to the very first step of GINA recommended treatment.

Another important gap to be addressed is to improve the education of people with asthma so that they can better understand the significance of their symptoms, to have their asthma diagnosed and once diagnosed, not to be stigmatized by their family, friends, colleagues, and society. A further key gap is the poor symptom recognition and episodic management of asthma by health care workers at the primary care level and poor diagnosis.[37] Finally, models

for comprehensive effective affordable asthma care within the Africa context have fallen into the gap.

There is an urgent need for interventions backed up by locally relevant evidence generation to close these gaps. Community-based interventions to educate people and health care workers about asthma, to reduce stigma and recognize asthma at the primary care level and offer appropriate treatments and asthma education, are essential components of a comprehensive approach to asthma in Africa.[38] The particular needs of children and adolescents (including around diagnostics and treatment options) compared to adults with asthma should be taken into account. The single ICS-formoterol inhaler-based approach has the potential (but needs the locally generated evidence) to transform asthma care by becoming the standard of care in the sub-Saharan African region and other areas of the world where asthma management is inadequate because of the multifaceted consequences of resource limitations.

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