Anemia in Pregnant Women and Children

Subjects: Others

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Globally, anemia is still a public health issue faced by people in low and high-income countries. Anemia is a condition in which a person's hemoglobin level is less than normal (below 11 g/dL for pregnant women and children aged 6–59 months). This study gives an overview of published scientific articles related to the prevalence, nutritional indicators, and social determinants of anemia in pregnant women and children aged 6 to 59 months living in Mozambique and Portugal.

anemia pregnant women children Mozambique Portugal

1. Introduction

Globally, it is still a public health issue faced by people in both low- and high-income countries and is a concern for adolescent girls, women of reproductive age (particularly during pregnancy), and children in the first years of life [1][2]. It impairs health and well-being in women and increases the risk of maternal and neonatal adverse outcomes [3][4]. Physiologic anemia is the most common cause of anemia in the neonatal period, being more pronounced in preterm infants compared with term infants, accounting that half of the cases are due to iron deficiency. In women, it may develop because of prenatal, perinatal (at delivery), or postpartum hemorrhage [5]. Iron deficiency during pregnancy can persist through lactation, although it may be partially alleviated because of lactational amenorrhea. Poor-quality diets can lead to iron deficiency anemia; on another hand, food and nutrition issues are determinants of iron supplementation and health at all levels, through structural macro-level policies, social conditions, or circumstances of daily life [6]. Worldwide, in 2019, anemia prevalence was 22.8% accounting for a total of 1.74 billion cases. In the same year, the prevalence was highest among children under five years (with a combined prevalence of 39.7%). Globally, 54.1% of anemia cases were mild, 42.5% were moderate, and 3.4% were severe. The regions with the highest-burden were South Asia, Western, and Central Sub-Saharan Africa [7]. According to the Global Nutrition Report, anemia affects 613.2 million (32.8% prevalence) adolescent girls and women aged 15 to 49 years, being its prevalence markedly higher in pregnant (35.3 million, 40.1%) than non-pregnant (577.9 million, 32.5%) adolescent girls and women [1].

According to data from the last Demographic Health Survey, in Mozambique, about 54.0% of women of reproductive age (15–49 years) and 69.0% of children aged 6–59 months had anemia [8]. It is estimated that in 2015, of a total of 388,345 cases of anemia, diarrhea, fever, and respiratory infections, only 45.2% received adequate health care [9]. Data from the EMPIRE study show that in 2014, the prevalence of anemia in the Portuguese population was 20.4%, and this scenario was classified as a public health problem. Of these cases, the vast majority (84.0%) were unaware of having anemia and only 2.0% of the Portuguese population received some form of treatment for this condition [10]. Estimates for the year 2019 indicated that about 45.8% of pregnant women aged 15–49 years living in Mozambique and 19.4% of pregnant women aged 15–49 years living in Portugal have anemia [11]. Anemia prevalence estimates were 68.2% and 14.3% in children aged 6–59 months living in Mozambique and Portugal, respectively [12]. Among the global nutrition goals of the World Health Organization for 2025, set by the World Health Assembly in 2012 and 2013, set to end malnutrition are a 50.0% reduction in anemia in women of reproductive age and a 30.0% reduction in low birth weight [13][14]. The prevention and treatment of anemia in women of childbearing age can help to reduce the low birth weight, perinatal and maternal mortality, and later diseases throughout life [3].

2. Anemia and Iron Deficiency Anemia (IDA) Prevalence

Global and regional anemia and iron deficiency anemia prevalence data were reported in five studies, but only two studies reported Mozambique and Portugal-specific data [15][16][17][18][19]. In 2013, the prevalence of iron deficiency cases (by thousands) was of about 5193.9 (4985.7–5442.7) and of about 1205.7 (1180.2 to 1227.5), in Mozambique and Portugal, respectively [17]. The absence of postpartum anemia in pregnant women with vaginal deliveries who were admitted in labor was also reported in one study trial conducted in Portugal during the years 2006 and 2007 [20]. A review reported that in 2005, the prevalence of anemia was severe (≥40.0%) among Mozambican children of preschool age (0–5 years) [15]. Nonetheless, for both countries, data on anemia and iron deficiency in pregnant women and children aged 6 to 59 months old are either outdated or remain unclear as the findings hereby reported were not disaggregated into these specific subgroups.

3. Malaria and HIV/AIDS

Two study trials that included 5469 pregnant women conducted between 1987–2013 in Mozambique, showed that mefloquine was more efficacious than sulfadoxine-pyrimethamine in HIV-uninfected women or daily cotrimoxazole prophylaxis in HIV-infected pregnant women for prevention of malaria infection and was associated with lower risk of maternal anemia (RR 0.84, 95% CI 0.76 to 0.94), no adverse effects on pregnancy outcomes (stillbirths and abortions), and no effects on low birth weight and prematurity. The high proportion of mefloquine-related adverse events constitutes an important barrier to its effectiveness for malaria preventive treatment in pregnant women [21]. Two other trials carried out between 2004–2008 in Mozambique found a large effect in reducing the risk of cord blood anemia (RR 0.49, 95% CI 0.30 to 0.80), and increase in mean cord packed cell volume (MD 1.01%, 95% CI 0.05 to 1.97) [22]. Nonetheless, the possible effects or benefits of routine malaria chemoprevention, hookworm and HIV/AIDS prevention and treatment strategies, and hookworms on reducing the risk of maternal anemia and negative pregnancy outcomes are still not well documented, in particular in provinces of Mozambique with the highest burden of malnutrition and food insecurity. Unsurprisingly, for Portugal comparatively to Mozambique, which has been facing a burden of malaria and HIV/AIDS for several years, data remain unclear.

4. Anemia in Pregnant Women and Children Living in Mozambique and Portugal

Evidence indicates that anemia plays a relevant role in disability and life imbalances in pregnant women and children under five years of age in Mozambique compared with Portugal [17][18][19]. These findings are consistent with previous studies in Portugal that showed a low prevalence of maternal anemia in the first half of pregnancy. However, careful attention needs to be paid as these studies were conducted with Portuguese women in the 20th week of pregnancy, whereas anemia prevalence often tends usually to be higher in late pregnancy, in women without iron supplementation [23]. Researcher's findings related to Mozambique agree well with previous reports that suggest that researchers are faced with a population of mothers with low iron stores, conditioning the hemoglobin values of infants in the first months of life [24]. Adding to this are many contextual cultural and socio-economic factors that may contribute to high levels of anemia throughout infancy in Mozambican children.

A growing body of literature showed that adolescents are at risk of iron deficiency because of their high iron requirements during the growth spurt period, particularly in girls for whom the start of menstruation leads to iron losses [25][26][27][28]. Concerning adolescent women, iron deficiency anemia is still a public health problem in both countries, since the data indicate that it is a risk factor for disadjusted life years [29][30]. The results found in Portuguese adolescent girls, also coincide with those reported in the last statistics of Portugal that showed prevalence rates of 9.0% in adolescent girls aged 12–15 years and 16.0% in adolescent girls aged 16–19 years [31]. Reports from previous years from the HELENA Study showed that the overall proportion of iron depletion among adolescents was 17.6%, being higher in girls compared to boys. By geographical location, rates were higher in Eastern Europe (Pecs, 23%) followed by Northern Europe (Stockholm, 19.0%), Western Europe (17.0% in Ghent and 19.0% in Lille), Central Europe (16.0% in Dortmund and 19.0% in Vienna) and 15.0% in Southern Europe (14.0% in Athens, 17.0% in Heraklion, 19.0% in Rome and 10.0% in Zaragoza) [26]. Other authors reported a prevalence of anemia of 2.6% in Portuguese adolescents living in the city of Porto, being these rates higher in girls (4.1%) compared to boys (1.0%) [25][32]. Nonetheless, these results only allow for statistical comparison of differences in iron status between selected European cities but not between European regions [26]. On the other hand, the findings are similar to those found in Spain, which shows that 15.0% of Spanish adolescents had iron deficiency anemia in a similar period, thus pointing more specifically to iron deficiency anemia as a clinical challenge in the daily practice of medicine at all levels of care [33]. There is evidence to suggest that dietary iron intake may be poor because of inadequate intake during adolescence or due to poor iron intake since infancy. Other factors such as a change in dietary habits by peer influence, eating disorders (refusal to eat, excessive weight-loss diets, and skipping meals), dependence on food that can be prepared rapidly and simply (fast food) can also play a crucial role on iron deficiency [25]. The findings suggest the need for specific attention to adequate dietary intake from infancy up to adolescence particularly for adolescent girls ensuring that their dietary iron intake is adequate to their requirements, agreeing with those results previously reported by De Andrade et al. [25]. Findings here reported related to anemia in Mozambican preschoolers under five years of age are also of huge concern, as other studies conducted in Sub-Saharan Africa showed that anemia persists through later ages of life, being also a burden in elder preschoolers aged 7–15 years [15][34].

The global burden of diseases in 2015 and 2016 classifies Mozambique as a low social demographic index country (SDI) and Portugal as a high-middle social demographic index country (SDI) [18][19][35]. In the year 2016, iron deficiency anemia was one of the leading causes of YLDs in low-middle-SDI and low-SDI quintiles. Pooled analysis that included among other African countries, neighbor-countries of Mozambique with a similar SDI (such as Tanzania, Eswatini, and Madagascar), showed that the risk of anemia among women living in the lowest wealth quintiles was 25.0% higher than among those in the highest wealth quintile. Women with no education were more likely to be anemic than were those with greater than secondary education. Patterning of anemia by socioeconomic status was also noted for children: a child living in a household in the lowest wealth quintile was 21.0% more likely to be anemic than were those in the highest wealth quintile [15]. Conditional on demographic and socioeconomic factors, the mother’s anemia status was among the strongest predictors of anemia in

children [15][36]. Age and gender were the social determinants more analyzed comparatively to indicators such as the years of schooling or wealth index [17][18][19][29]. Previous studies highlighted the relevance of social determinants analysis to better understand the causal association of social determinants and the occurrence of anemia [37]. Despite the relevance of this issue has been studied in other countries hereby mentioned, limited research evidence on anemia's social and structural determinants prevails for Mozambique and Portugal.

A gap of information on anemia, other nutritional indicators (in addition to iron deficiency), and social determinants in pregnant women and children between 6 and 59 months of age living in Mozambique and Portugal are highly observed in the overview. Little literature related to anemia; researcher's focus subgroup was also found at Index Medical Portuguese Journals—a Portuguese national database with non-open access. Anemia prevalence among Portuguese pregnant women and Mozambican children under 59 months old was a topic approached in some of the publications found, nonetheless, the majority of studies had its focus on supplementation with iron during pregnancy, preschoolers' food habits, and case studies interlinked with anemia during infancy [23][24][38][39][40][41][42][43]. More research is required to gather scientific-based evidence that can contribute to improving strategies that allow researchers to achieve the goals established by the World Assembly of WHO of reducing anemia in women of reproductive age, low birth weight, and under-five mortality. Undoubtedly efforts to attain these goals are interlinked to achieving the following Sustainable Development Goals (SDGs): "2.2 End all forms of malnutrition", "3.1. Reduce global maternal mortality ratio to less than 70 per 100 000 live births by 2030" and "3.2. End preventable deaths of newborns and children under five years of age, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1000 live births and under-5 mortality to at least as low as 25 per 1000 live births, by 2030" [44].

An opportunity acknowledged by the Universal Health Coverage (UHC) 2030's platform is that the inclusion of universal health coverage in the SDGs can be a coherent approach to health, allowing the acceleration of equitable and sustainable progress toward universal health coverage and health systems strengthening at global and country levels [45]. Even though both countries which were the focus of the study present huge contextual, geographic, and socioeconomic differences, Mozambique despite some progress (made in previous years) had a remarkably low UHC service coverage index and life expectancy (of 46.0; 61 years) compared with Portugal (of 82.0; 80 years) by the year 2017. External health expenditure was also strikingly higher in Mozambique (62.92) compared with Portugal (0.09) by the year 2018 [45][46]. With this in mind, the best performances in health indicators are clearly observed for Portugal compared with Mozambique where major health (triple burden diseases, infectious illnesses), lack of water, lack of good sanitation, lack of access to health facilities problems, as well as food insecurity still prevails [47]. Nevertheless, Costa et al. showed that throughout Eastern and Southern European countries, including Portugal, population health inequalities prevail across metropolitan areas, generally, with municipalities presenting worse health determinants value scores. Despite geographic disparities in the distribution of value scores of health outcomes between municipalities may not be as evident as expected in Portugal, more specifically in Lisbon, health inequalities still prevail and need to be tackled [48]. As stated by Malta et al. [47], Mozambique and Portugal are both Community of Portuguese Language Countries (CPLP), and the strengthening of network collaborations focused on research, and more specifically on anemia can be of added value to give more visibility to this health issue and to improve health policies and to reinforce strategies aimed to reduce anemia between pregnant women and children under five years living in Mozambique and Portugal.

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