LETTER TO THE EDITOR : MARCH TOWARDS PREVENTION OF NEURAL TUBE DEFECTS IN AFRICA

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Résumé : Les malformations du tube neural constituent de nos jours un vrai problème de santé publique en Afrique. C'est la pathologie pédiatrique la plus fréquemment retrouvée dans les services de neurochirurgie en Afrique, responsable de handicap neurologique grave (moteur, sensitif, sphinctérien et cognitif). Elle impose une action collective continentale pour mieux évaluer leur incidence et leur prévalence réelles, restées jusque-là mal connues, du fait des résultats publiés d'origine presque toujours hospitalière, et au-delà, mettre en place des mesures rapides et urgentes de prévention.

Mots clés *: Malformation du tube neural, Recherche continentale, Incidence, Prévalence, Prévention.*

Abstract : Neural tube defects currently constitute a real public health problem in Africa. They still remain the most frequent pediatric pathology found in neurosurgery departments on the continent lead to serious neurological disability (motor, sensory, sphincter and cognitive). This requires continental collective action to better assess their real incidence and prevalence, which until now remained poorly known, due to published results usually of hospital origin, and beyond that, to implement rapid and urgent continental prevention measures.

Keywords: *Neural tube defect, Continental research, Incidence, Prevalence, Prevention*

Today, the number of neural tube defects is estimated at more than 300,000 new cases/year worldwide with a prevalence of 18.6/10,000 live births(4). This prevalence remains very variable throughout the world and differs depending on the standard of living of the populations (3).

In Europe, this number is much lower and according to studies, is around 9.1 to 11.2/10,000 live births (5).

In Africa, all studies agree with the high frequency of these malformative abnormalities, especially in countries where food fortification is still not mandatory (1,6), but the data found in the literature are almost all from hospital and only concern one or a few centers at a time (2). It is therefore difficult to be able to count on a national, then continental scale, the exact number of these malformations.

My talk in Togo Republic neurosurgery congress last February 2023, "Walk together, towards a continental prevention on neural tube defects", led to approval discussion asking at the end to review literature and propose a continental survey.

In Cameroon, the prevalence increased from 1.99 in 2006 (7) to 2.54 cases of spina bifida and hydrocephalus per 1000 live births in 2017 (8). About Warf et al. in Uganda, the incidence is around one malformation per 1000 births (9), which would correspond by extrapolation to an average of 1400 malformed babies per year, including 66% with associated congenital hydrocephalus.

Myelomeningocele represents the most serious viable form and exceeds in terms of frequency encephaloceles with a ratio of 3.9:1 in Nigeria (10), 5.6:1 in Niger (11) and 8:1 in South Africa (12). In Burkina Faso, Niger, Ivory Coast and Senegal, maternal hyperthermia at the start of pregnancy, consanguinity, young age of the mother as well as multiparity are all parameters found in studies and assumed to be involved. In the occurrence of the pathology (11,13–15).

The same remarks are made in Togo, Ivory Coast and Niger regarding the insufficient knowledge of midwives, matrons and first health workers in contact with the mother-child couple, on the prevention of illness. This fact leads in worsening the immediate care of newborns carrying these malformations (16).

Since 1971, MacMahon B and Yen S had the idea in qualifying the burden of neural tube defects as an epidemic (17). Nowadays, it is recognized as such, in the world (6,18). They represent a real socio-economic burden for families and States. Neural tube defects occupy the second place after cardiovascular malformations in terms of frequency and are responsible for high mortality (19,20).

They lead to dramatic consequences for survivors, with a very degraded quality of life including sensory and/or motor neurological disorders, with usually sphincter, orthopedic and/or cognitive disorders most often associated with hydrocephalus and exposing to an increased risk of meningitis (21).

The etiologies are therefore multifactorial classified into preventable causes (3) (nutritional, genetic, medicinal, etc.) and non-preventable (genetic, environmental, toxic, etc.) giving different varied types:

- Spina bifida F (folate and folic acid deficiency),

- Spina bifida V (related to antiepileptic drugs such as sodium valproate),

- Spina bifida DM (related to insulin-dependent gestational diabetes mellitus)

- and Spina bifida X for which cause has not been found, namely causes linked to consanguinity, genetics, toxic in relation to taking decoctions, herbal teas or self-medication at the start of gestation, the young age of the mother, multiparity, etc. (11,15,21).

The nutritional origins and those linked to consanguinity seem for us being those on which good primary prevention can act.

Food fortification has been implemented in other countries with success and reveals that it is a safe, secure, and effective method, without harmful effects, reducing the financial costs of care for the State and families even if some authors reported hidden vitamin B12 anemia, some chronic pathologies as cancers or cardio vascular diseases (22–24). However, in general, this food fortification has proven its effectiveness in reducing the incidence and prevalence of the disease, and in the occurrence of severe forms (21,25).

It is for all these reasons that the Niger team, wants to collaborate with all the continental neurosurgery teams, proposes, as part of prevention, an overall African movement to better understand and fight against this scourge, which undermines the health of our populations.

This approach also aims to promote health and future continental scientific research as well as improve medical skills in the screening and management of surviving cases of neural tube malformation.

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