Shaken Baby Syndrome in Brazil: a 6 years' data analysis

Síndrome do Bebê Sacudido no Brasil: análise de dados em 6 anos

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ABSTRACT

Introduction: *Abusive Head Trauma (AHT) is every act of abuse inflicted on children under 5 years old that can cause injury to the brain or other structures of the central nervous system.* **Objective:** *to expose national data and statistics with the purpose of verifying the incidence of AHT in the different Brazilian regions and comparing with the incidence during the pandemics.* **Methods:** *A retrospective and analytical study was performed to evaluate the incidence of abusive head trauma to children up to 4 years old in Brazil. The data was collected in the Brazilian epidemiological information database using the keywords "Intracranial Trauma" and "Abuse Syndrome", the age group was up to 4 years old, from January 2016 to December 2021 from the five different federative regions. Then, it was calculated the incidence of the reported cases in each region (North, Northeast, Midwest, Southeast and South).* **Results:** *From 2016 to 2021 45,556 cases were reported, the Southeast had 44% of the cases and during the pandemics period (2020 to 2021) there was a decrease in reporting.* **Conclusion***: When analyzing the incidence per region, the South had the highest one even with a greater Human Development Index, indicating a poor influence of socio economics status to the number of cases compared to the emotional issue as a more important factor.*

Keywords: *Shaken Baby Syndrome; Child abuse; Brain injuries; Abusive Head Trauma*

RESUMO

Introdução: *O Trauma Craniano Violento (TCV) engloba atos de violência em crianças menores de 5 anos que provocam lesões cerebrais e nas demais estruturas do sistema nervoso central.* **Objetivo:** *expor dados estatísticos nacionais com o intuito de verificar a incidência do TCV em diferentes regiões do Brasil e comparar com a incidência durante a pandemia.* **Métodos:** *Trata-se de uma análise epidemiológica retrospectiva, cujos dados foram obtidos por meio de consulta ao Departamento de Informática do Sistema Único de Saúde (DATASUS), de Morbidade Hospitalar do SUS (SIH/SUS). Foram coletados dados anuais registrados dentre o período de janeiro de 2016 a dezembro de 2021 em cada região federativa do Brasil acerca do número de casos notificados de indivíduos dentre a faixa etária de 0 a 4 anos, sem distinção de gênero ou caráter de atendimento, incluídos como descritores "Traumatismo Craniano" e "Síndrome dos Maus-Tratos". Posteriormente, foi calculada a incidência dos casos notificados em cada região.* **Resultados:** *Entre 2016 e 2021, notificou-se 45.556 casos, dos quais a grande maioria (19.936) é referente à região sudeste (44%). Nos anos de 2020 e 2021, período referente à pandemia da COVID-19, observou-se os menores índices de notificação.* **Conclusão:** *Analisando as incidências por região, o Sul mostrou maior número, mesmo possuindo melhor Índice de Desenvolvimento Humano. Concluiu-se que a situação socioeconômica tem fraca influência em comparação à situação emocional dos cuidadores como fator de risco.*

Palavras-Chave: *Síndrome do Bebê Sacudido; Maus-tratos; Lesão cerebral; Trauma Craniano Violento*

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INTRODUCTION

In 2009 the American Academy of Pediatrics (AAP) recommended that the term Shaken Baby Syndrome should be replaced by Abusive Head Trauma (AHT), because it covers not only the act of aggressively shaking an infant, but any other abusive act in children under 5 years old that can cause injury to the brain or others structures of the central nervous system[1-3]. According to the AAP, there are clinical studies that shows the significance of the "shaking" as an injury mechanism, one of them is a study that had 112 admissions for AHT, in which 100% reported intensive shaking and 55% were repeated episodes with a mean incidence of 10 times[4].

Although there is still divergence in the scientific community about the signs of child abuse, there are three main suggestive signs that the clinician should pay attention: subdural haematoma, retinal hemorrhage and cerebral edema, mostly if there is no obviously cause such as open trauma[5,6]. A study made in Norway[7] evaluates 17 AHT cases in judicial court, aiming to prove if these signs actually were caused by abuse, the results were that the findings alone cannot diagnose AHT and it should be made an analysis on the family context, inflicting the relevance of combining clinical, physical and neuroimaging findings[8,9].

In Brazil, according to the Brazilian Federal Council of Medicine[10], any form of physical or mental damage to the child by means of chemical intoxication, drug abuse, accidents, aggression, self-harm and negligence are classified as compulsory notification[10].

Due to the low number of Brazilian papers about this matter, the present study exposes national data and statistics with the purpose of verifying the incidence of AHT in the different Brazilian regions and comparing with the incidence during the pandemics.

METHODS

A retrospective and analytical study was performed to evaluate the incidence of abusive head trauma to children up to 4 years old in Brazil. The data was collected in the Brazilian public health information database[11] (DATASUS) using the numbers of hospitalizations according to the federative regions; the keywords 'Intracranial Trauma' and 'Abuse Syndrome'; the age group up to 4 years old; the period from January 2016 to December 2021; and no distinction of gender. Then, using the same database[11] (DATASUS) in the section "Population Projection of each Federal Unity per Gender and Age", the total population of the selected age was gathered and, afterwards, the data was organized in a sheet software and analyzed, then reached the incidence of the reported cases in the five federative regions (North, Northeast, Midwest, Southeast and South).

There was no need to submit this study to the ethics committee because it is a retrospective research and all the data are available online in the Brazilian Public Health System website and are of public domain[11].

RESULTS & DISCUSSION

From 2016 to 2021, 45,556 cases of AHT were reported. The Southeast region had most of the cases (19,936) representing 44%, followed by Northeast with 9,784 cases (21%), South with 8,659 cases (19%), North with 3,893 cases (9%) and Midwest with 3,284 cases (7%) (Figure 1)[11]. The years 2020 and 2021, during the COVID-19 pandemics, had the lowest registries of reported cases with 7,385 and 7,402 respectively. The other years, the number of cases were 7,715 (2016), 7,631 (2017), 7,590 (2018) and 7,815 (2019) (Figure 2)[11].

The lower incidence of AHT during the years 2020 and 2021 could represent an underreported number of cases due to the social

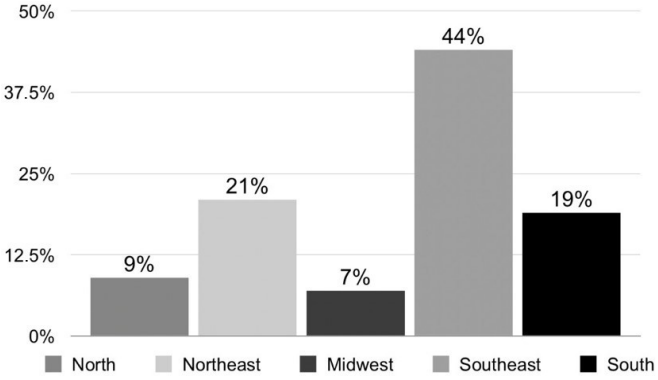

Figure 1. Distribution of the percentile rank equivalents of cases reported as Abusive Head Trauma between 2016-2021.

distancing time during the COVID-19 pandemic, which resulted in a decreased search for medical services. Also, it could correspond to the actual number of notifications. According to Cowley and Adesman[12], there is evidence that AHT cases tend to rise once there is a calamity occurring such as economic breakdown, wars, epidemics and natural disasters. An analytical study made in Necker Hospital for Sick Children (France) shows 99 cases of AHT between 2017-2021 and compares the pre-pandemics findings to the pandemics ones (2017-2019 and 2020-2021), resulting in a major occurrence and severity of cases during the COVID-19 pandemics[13]. Then, raising doubt, maybe the data gathered in this study is not the actual total of cases that occurred.

About the absolute number of cases, the Southeast region represents almost half the total cases, but it is indispensable to notice the difference between absolute and incident cases in each region in Brazil. Once calculated, the incidence of AHT in South, Southeast and Midwest were the highest within the five regions, with 80, 62, 49 cases per 100,000 inhabitants up to 4 years old, respectively (Figure 3), showing divergence. The South has 1,8 million children, the Southeast 5 million and the Midwest 1,2 million[11].

This difference could be for several reasons, both in terms of population and in terms of the information system. Thus, epidemiological surveillance degree, underreporting, diagnostic failure or negligence, outdated database and demographic density are examples of factors that influence the data, underestimating those[14].

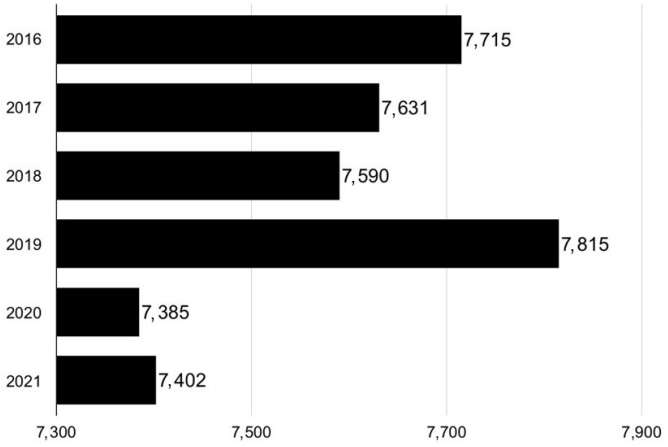

Figure 2. Compulsory reports of Abusive Head Trauma cases reported between 2016-2021 in Brazil.

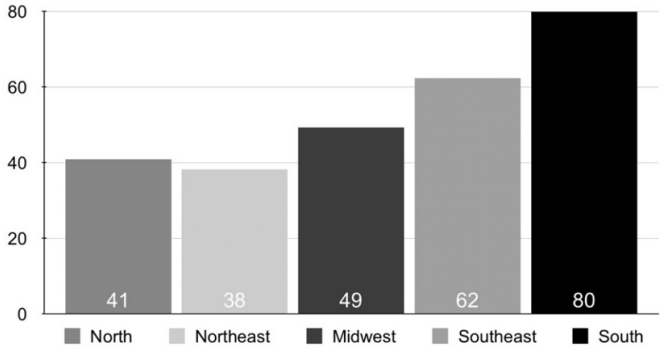

Figure 3. Incidence of AHT in Brazil between 2016 and 2021 per 100,000 inhabitants up to 4 years old.

According to the data disclosed by the Brazilian Institute of Geography and Statistics (IBGE - Instituto Brasileiro de Geografia e Estatística) in 2019, the regions Southeast, Midwest and South had the highest Human Development Index in Brazil[15,16]. Besides, South and Southeast have the highest Gross Domestic Product within the five regions[16]. Therefore, it can be said that AHT is not attached to a certain socioeconomic status and could happen in any social sphere, even an educational stage or family financial situation favorable for child development cannot reassure the safety of the infants. Once the most common trigger for AHT is the restless crying that is known to negatively affect the caretaker with feelings of tiredness, resentment and irritation[17,18].

A Brazilian study in 2016 involving 90 participants to evaluate the consequences of shaking to stop the crying, resulted in 90% of the participants believing that there are no severe consequences in shaking a baby and 57,7% would shake again to soothe the baby if needed. These results cause concerns in terms of probability of recurrences and claim the need for more prevention strategies and instruction of caretakers[18].

When dealing with nervous system insults, the probability of causing neurological damage and compromising child development is highly likely as well as influencing the mortality rate[19-21]. The AAP, in 2020, reported that the international incidence of AHT was 32-38 cases for every 100,000 children in their first year of life, with a 25% fatality rate[22]. More than 30% have immediate and late consequences after an insult, amongst them: respiratory failure, aggressiveness, seizures, cognitive impairment, blindness, hearing loss, cerebral palsy and decreased life expectancy[4,23-26]. Taking into consideration that the data collected from the Brazilian database registered children up to 4 years of age but the majority

of cases of AHT happens in the first year of life and comparing them to the findings from the AAP, it's observed that Brazil still needs policies to prevent these abuses.

CONCLUSION

South, Southeast and Midwest, in this particular order, represents the majority incidence in abusive pediatric trauma in Brazil, having no influence of socio economics but mostly an emotional issue from the caretakers. The incidence of AHT has decreased in the years of the pandemics in Brazil. The diagnoses of abusive head trauma tend to be easily neglected for its demand of greater attention in medical evaluations once the clinical findings of abuse are not always obvious. The investigation should consist in a thorough clinical and physical examination, review of the family context and neuroimaging. Once the abuse is considered, the child should be protected and the case notified. Specifically in Brazil, it is concluded that a major awareness and mitigation of this kind of tragedy is needed, involving not only the caretakers but also medical professionals.

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