

Microcephaly: Clinical and Sociodemographic Profile of Affected Children in the Municipality of Cacoal, Rondônia, Brazil

Teresinha Cícera Teodora Viana¹, Leonardo Severo da Luz Neto², José Arilson de Souza³, Fátima Maia Queiroga⁴, Elder Gomes Ramos⁵, Helio Franklin Rodrigues de Almeida⁶, Cleovanio Oliveira da Silva^{7a} and Gabriel Santos Sampaio^{7b}

¹Master in Health Sciences (IAMSPE) (2017).Teaching Advisor of the Undergraduate Nursing Course.Graduated from the Faculty of Biomedical Sciences of Cacoal - FACIMED (2006).Specialization Family and Community Health, FACIMED institution (2013).

²Master in Education - Autonomous University of Barcelona, Spain. Master in Psychology - University of São Paulo. Master in Religious Studies - Faculty of Theological Education Logos of São Paulo.Graduated of Nursing,Physical Educationand Theology.Professor and Researchers from Department of Collective Health, GEITEC and GEISC of the Federal University of Rondônia at Porto Velho Campus, Brazil.

³PhD in Regional Development and Environment at the Federal University of Rondônia (UNIR), Brazil.Professor and Researchers from Federal University of Rondônia at Vilhena Campus, Brazil.

⁴PhD in Psychology from the University of Havana, degree in Psychology from the Educational Foundation of Bauru, SP; Member of the Research Group Subjectivity Study and Research Center in the Amazon - CEPESAM - CNPq (<http://dgp.cnpq.br/dgp/espelhogrupo/0792728471040656>) - certified by the institution. Lecturer crowded in the Department of Psychology at the Federal University of Rondônia. Name in citations: Fatima Queiroga

⁵PhD in Administration from the National University of Missions (UNAM), Argentina.Professor and Researcher at the Federal University of Rondôniaat Vilhena Campus, Brazil.

⁶PhD in Physiology from the University of A Coruña, Spain Revalidation University of Brasília, Brazil, Master of Exercise Physiology - Federal University of Santa Maria, Brazil, Graduated in Physical Education – State University of Pará, Brazil. Professor of the Department of Collective Health, Researcher at the OBSAT and Researcher of GEISC of the Federal University of Rondonia, Brazil.

^{7ab}Graduating in Nursing from the Faculty of Biomedical Sciences of Cacoal/FACIMED (2018).

Abstract— *Microcephaly is a congenital malformation, which will impair brain development. It can occur due to genetic complications, classified as primary with genetic character and secondary non-genetic as; alcohol, drugs, radiation exposure and one of the most common is transmission of the zika virus that is transmitted by the aedesaegypti bug. The objective of this study was to analyze the clinical and socio-demographic profile of children notified with microcephaly in the city of Cacoal-RO. This is a descriptive, cross-sectional, qualitative study. The study was carried out with children affected with microcephaly registered in SINAN, the data collection was carried out by applying a semi-structured questionnaire prepared by the researchers. The data were collected through a questionnaire with 15 questions, the data collection was structured in 4 phases. The data obtained correspond to 3 children with microcephaly, with a predominance of females 3 (100%) aged between 2 to 4 years (66.7%). The parents' age group prevailed 18 to 29 years (66.7%), it was observed that the predominant family income was 1 to 2 minimum wages. In relation to cranial perimeter, 2 (66, 7%) was adequate for age, with 1 (33.3%) being below the expected for age, in relation to weight 2 (66.7%) was underweight for age followed by 1 (33, 3%) adequate. Children are monitored in health services, care is provided in specialized units. It was concluded that in view of the results obtained, knowledge of the family and social context in which the child is inserted is essential for planning care.*

Keywords— *Microcephaly, children, Nursing care.*

I. INTRODUCTION

Microcephaly is a congenital malformation that does not fully develop the newborn's brain, in which to consider a child with microcephaly the cephalic perimeter is less than two or more standard deviations in relation to sex, age or gestation time, the child with microcephaly due to this malformation there will be a delay in development and growth, thus affecting even simpler things like sitting, crawling, grabbing, among others (BRASIL, 2015).

In Brazil, between October 2015 and January 2016, there were approximately 4,783 notifications of microcephaly cases, in which of these notified cases, 3,174 (76.7%) are still under investigation. Among the total of notified cases (4,783), in 2015 there were 3,174 notified cases (66.4%), in January 2016, 1,599 cases were reported (33.4). In the total number of cases, 1113 (23.2%) would have already been investigated and classified, among those cases that were investigated and classified 404 cases would have been confirmed for microcephaly or some alteration in the central nervous system (SALGE, 2016).

Up to December 2016, 10,867 cases of microcephaly were reported, according to definitions in the surveillance protocol, out of the number of reported cases 3,183 (29.3%) continued to be investigated, and 7,684 (70, 7%) with 2,366 cases confirmed, out of the total number of notified 582 (5.3%) cases evolved to fetal or neonatal death (BRASIL, 2016).

In the period between 2000 and 2014 the number of live births with microcephaly were 2,464 with an average of 164 per year, in 2015 there was an increase of nine times more than the average number of cases per year, which was 1,608 cases in the year. year 2015. (MARINHO, 2016).

Among the causes characterized as secondary we have the Zika Virus, which is transmitted by the mosquito vector *Aedes aegypti*, the same vector that transmits Dengue and Chikungunya. In Brazil, the Zika virus is the most associated cause of microcephaly to date, the first cases being notified by the Ministry of Health (MS) in October 2014 in the state of Rio Grande do Norte, however there was only confirmation of the first cases of microcephaly a from the year 2015 (OLIVEIRA *et al.*, 2016).

Within the diagnosis of microcephaly, there are some methods that make it possible to achieve the desired results, they are nonspecific: they are tests with a complementary character within the search for the identification of the disease, methods that can identify variations in many laboratory tests, among which are: protein C reactive, gamma glutamyltransferase, markers of

inflammatory activity, leukopenia, among others. The diagnosis of specific character, on the other hand, directs the investigation for the Zika virus through the detection of viral RNA from clinical specimens (BRASIL, 2016).

Another important method in the diagnosis of microcephaly is the morphological examination of the skull, where its purpose is to measure the circumference or cranial perimeter, which will allow a comparison with the curves considered normal by the Ministry of Health (MS), thus lower results those considered normal, (31.9 cm for males and 31.5 cm for females), will be diagnosed positive for microcephaly (VITORINO, 2017).

There is no specific treatment for a child with microcephaly, however there are actions that help in the development of this child. This monitoring is carried out by several specialists, depending on the complication caused by microcephaly, the assistance that is recommended by the Unified Health System has the objective of neurophysicomotor rehabilitation of these children who were affected by microcephaly (BRASIL, 2015).

In Brazil, in 2015 there was a high rate of microcephaly cases, so the Ministry of Health developed protocols for guidelines, clinical, epidemiological investigations and case definitions for microcephaly. To avoid an increase in the number of cases, possible causes and preventable precautions should be identified in order to minimize the amount of microcephaly reports, promoting actions such as guidance for pregnant women on the risk factors that can be acquired during pregnancy, such as Zika Virus, syphilis, alcohol, radiation exposure, among others that can evolve to microcephaly (BRASIL, 2015).

The importance of knowing the demographic profile of these children notified with microcephaly is justified by not having studies related to the topic in the state of Rondônia because it is a clientele that needs specialized care to not further compromise their development, which is already normally impaired, thus avoiding neurological, physical, motor and social damage. The relevance of tracing the quality of care provided at health units will contribute to other studies in the future, taking into account that nurses have a contribution to the development of children with microcephaly, together with other professionals with the aim of reducing the sequelae that are caused by microcephaly.

The general objective of the study was to analyze the clinical and socio-demographic profile of the children notified with microcephaly in the municipality of Cacoal-RO, the specific objectives were: To identify the

sociodemographic and clinical characteristics of the children affected by microcephaly, to evaluate growth and development through the notes in the child's handbook through standardized graphics on the handbook; describe the childcare provided to the child in primary health care by evaluating the variables (medical consultations, nursing consultations, immunization, vitamin A supplementation), verify the knowledge of professional nurses regarding the monitoring of children with microcephaly through the guide on early stimulation in Primary Care.

II. MATERIALS AND METHODS

A descriptive, qualitative and quantitative field research was carried out in order to enable the assessment of trends in health status and to compare variables between individuals, to provide a basis for planning, providing and evaluating health services, to identify problems to be studied through analytical methods and suggest areas of interest for investigation, transversal, because this study analyzed the state of the individuals contained therein in relation to the presence or absence of exposure, cause and disease in a single moment (ESTRELA, 2005). According to Gil (2008), the method of descriptive research has as its primary purpose the descriptions of the characteristics of a given population or phenomenon or establishment of variable relationships.

Qualitative, as this method seeks to explain reality in terms of concepts, behaviors, perceptions and assessments of the people object of the study (DEMO, 2000). Quantitative, as it seeks objective explanations for the phenomena thus leading to an emphasis on the numerical data that are the basis of this research method, which will be carried out in units in the Municipality of Cacoal-RO.

Data collection was carried out in 4 stages using a questionnaire containing 15 (fifteen) multiple choice questions and open questions adapted from the work of Cruz, Silva and Santos (2017) in "Clinical, sociodemographic and functional profile of infants with microcephaly treated in the occupational therapy sector of a center specialized in rehabilitation." In the first stage, a questionnaire was applied containing variables related to the characterization of the sociodemographic profile, such as: origin (rural or urban) age group of the child and parents, family income, educational level of parents, school situation of the child. In the second stage, the child's guardians were asked to answer questions related to the child's clinical conditions (sex, gestational age at birth, type of delivery, complications at birth, birth weight, cranialperimeter at birth, exams performed at birth, the cause of microcephaly). The third stage was asked to

parents about the care of the child in the health unit, evaluating the following variables (consultation with a doctor in the health unit, nursing consultation, vaccination status, growth and development assessment, supplementation of vitamin A). In the fourth stage, the knowledge of the nursing professionals on the monitoring of children with microcephaly was evaluated through protocols standardized by the Ministry of Health, carried out some training in handling children with microcephaly and what are the main difficulties in caring for children with microcephaly.

Data collection took place in the months of June and September 2018, in the morning and/or evening periods.

The growth variable was measured by weight, body length and cranialperimeter using the Z score as a reference standard. This score is a terminology used to represent the variability of a given parameter between individuals and represents the distance, in the form of deviation- standard that the values of that parameter can assume in the population in relation to the average value.

After the project was approved, the researchers scheduled a meeting with the nurses responsible for each family health team, explaining the purpose of the study and later with the community health agents to locate the addresses of the respective children. In the first moment, the number of children with microcephaly was surveyed by the nurse of each health team. At this moment, the nurse was invited to participate in the research by answering the questionnaire of the fourth stage regarding the knowledge of the nurse about the care of children with microcephaly. After collecting these data, a visit to the child's home was scheduled through the CHA (Community Health Agent) to collect data with the parents or guardians. The researchers informed the parents of the children that the purpose of the interview is to collect data on the situation of children with microcephaly in the municipality and that at any time the parents would be free to interrupt the researchers to clarify doubts about the research and the condition itself of child.

The research was carried out after the project was approved by the Ethics and Research Committee of the Faculty of Biomedical Sciences of Cacoal - FACIMED; as well as the authorization of the primary care coordinator, manager, nurse who work at the BHU and those responsible for the children, ensuring the ethical rigor of research involving human beings. The study did not pose any risk to children, as it preserved any and all personal data from any of the samples. The project was initially considered by the Ethics and Research Committee (CEP) and approved according to 2,330,647. The data were inserted in the Word 2007 and Excel programs, were analyzed and tabulated, in which

they are exposed in the work in the form of a table by means of descriptive statistics.

III. PRESENTATION AND DISCUSSION OF RESULTS

In this study, the population was initially constituted according to SINAN data. There would be 6 children between the age group of 0 to 6 years with a diagnosis of microcephaly. However, it was possible to collect data from only 3 children, because at the time of collection, 3 children could not be interviewed for the following reasons: 1 child was in the state of São Paulo undergoing treatment, one moved to Rolim de Moura and another had not confirmed the diagnosis of microcephaly.

Participants in the study were responsible for registered children living in the municipality of Cacoal-RO diagnosed with microcephaly. According to the table below, the predominant gender was female with 3 (100%), of the sample obtained 3 (100%) lived with father and mother, in relation to age group, a greater number of children can be

observed at the age of 2 to 4 years 2 (66.7%), in a smaller number are children aged 7 to 12 months 1 (33.3%), with relation to the age group of the parents, the prevalence was 18 to 29 years 2 (66, 7%) in a lower percentage are those aged 30 to 45 years 1 (33.3%), with regard to family income, there was a dominant income of 1 to 2 minimum wages 3 (100%), lastly the parents' schooling observed a higher number in relation to parents with incomplete high school 3 (49.9%), respectively incomplete elementary school 1 (16.7%), (See Table 1)

Regarding the characterization of children, Table 1 explains a distribution with 3 (100%) female children, the lowest age found was seven months and the highest age was 4 years.

Low family income was one of the aspects found that corresponds to other studies, being one of the main difficulties reported by parents, since low income makes it difficult in the care that children with microcephaly need in their daily lives, such care as transportation to specialized centers (physiotherapy), differentiated food and medication. (FREITAS, 2018).

Table 1- Characterization of the sociodemographic profile of families and children affected with microcephaly registered at SINAN in the municipality of Cacoal-RO 2018.

Variables	N°	%
Sex		
Feminine	3	100%
Who do you live with		
Father and mother	3	100%
Child Age Range		
7to 12 months	1	33,3%
2to 4 years	2	66,7%
Parents' Age Group		
18 to 29 years	4	66,7%
30 to 45 years	2	33,33%
Family income		
1st to 2nd minimum wage	3	100%
Parents' Education		
Incomplete Elementary School	1	16,6%
Complete primary education	1	16,6%
Incomplete high school	3	49,99%
Others	1	16,6%

SOURCE: Silva, Sampaio, Viana. 2018

According to the data found, most parents had low education and low income, this shows how socioeconomic conditions are associated with knowledge about risk factors in relation to pregnancy and the complications that the mother and baby may suffer during the period pregnancy, this can also hamper access to health services. (ABREU *et al.*, 2016).

The age range found in the study was 18 to 45 years, there was a difference for other studies in the maximum value in the age of the parents that was 59, however in relation to the minimum value in the age of the parents the results corroborate with other studies, this finding shows how fundamental is the knowledge of the family and social context in which the child is inserted, since the low age of the parents can compromise pregnancy and the baby's development due to several conditions, such as restricted

access to health services, vulnerability social, the mother's difficulty in understanding the baby's real needs and inadequate family and social support (ABREU *et al.*, 2016).

The table below shows the clinical conditions of the children, where it demonstrated that 2 (66.7%) the cranialperimeter was expected to grow for age and 1 (33.3%) below the expected for age, in relation to the height observed Although 3 (100%) of the children were of adequate height for their age, it was found that 2 (66.7%) were underweight for their age and 1 (33.3%) was underweight for their age, in relation to the BMI it was noted that 3 (100%) were suitable for their age, the cranialperimeter at birth of the children, observed that 2 (66.7%) CP less than 30 cm and 1 (33.3%) were born with CP greater than 31.5 cm.

Table 2. Anthropometric assessment of children with microcephaly registered at SINAN, in the municipality of Cacoal-RO 2018.

Variables	N°	%
Cranial Perimeter		
Below expected for age	1	33,3%
Expected growth for age	2	66,7%
Stature		
Suitable for age	3	100%
Weight		
Low weight for age	2	66,7%
Suitable weight for age	1	33,3%
IMC		
Suitable weight for age	3	100%

SOURCE: Silva, Sampaio, Viana. 2018

In this study, there was a predominance in the number of children born with CP less than 30 cm, in which in another study reported exactly the opposite, where a greater number (52%) of children were born with CP greater than 30 cm. (CRUZ *et al.*, 2016). However, it was observed that this finding corroborated with another result found, where there is a greater number of children with microcephaly with a perimeter smaller than 30 cm at birth. (VITORINO, 2017).

Regarding anthropometric measurements, length and cranialperimeter, weight, there was a difference. This finding validates the understanding that children with microcephaly when compared to children not diagnosed with microcephaly present different characteristics in anthropometric conditions and associated with this, it was observed that there was no adequate weight gain for the age group, where the development of the perimeter

headache was also affected, falling below the standard values recommended by the Ministry of Health.

It was observed that there was a predominance of children who were underweight for their age, 2 (66.7%), and 1 (33.3%) with an appropriate weight for their age, this result corroborated with a study by Junior *et al.*, 2017 ; in relation to height, there was a divergence, because the result found was that 3 (100%) of the children were of adequate height for their age, different from the study by Junior *et al.*, 2017 ; in which a large part of the children were of an inadequate height for their age.

The table below shows through the questionnaire applied to parents, that 3 (100%) of the children interviewed went through and go through medical consultations regularly, regarding nursing consultations, 2 (66.7%) of the interviewees said they had passed and were passing

through regularly consulted nursing consultations, and 1 (33.3%) reported that they did not and do not undergo regular nursing consultations, regarding the vaccination situation, it was possible to observe through the child's vaccine record that 3 (100 %) of the interviewees had age-appropriate vaccines, with regard to the assessment of growth and development, 3 (100%) of the interviewed

parents reported that their children have undergone and are undergoing evaluation at the specialized centers they attend, with regard to regards supplementation with vitamin A, 1 (33,3%) reported that the child received the supplementation, and 2 (66.7%) said they did not receive it.

Table 3. Characterization of care in the health units of children with microcephaly registered at SINAN, in the municipality of Cacoal-RO 2018.

Variables	No.	%
Child has had or goes through a Medical Consultation regularly		
Yes	3	100%
The child has gone through or goes through a Nursing Consultation		
Yes	2	66,66%
Not	1	33,33%
Vaccination status is complete for age		
Yes	3	100%
Growth and development assessment is carried out.		
Yes	3	100%
Received vitamin A supplementation		
Yes	1	33,33%
Not	2	66,66%

SOURCE: Silva, Sampaio, Viana. 2018

The study showed that 2 (66.7%) of the children went through nursing consultations and 1 (33.3%) did not, of these only 1 (33.3%) maintained regular consultations until the date of the study, this finding shows that nursing care must seek integrality, in order to guarantee the assistance of the needs they present. This result leads us to the duty of the nurse to seek the resolution of the problems faced by the family through referrals to reference services and laboratory support, services that are usually combined in large urban centers. There is no doubt, in relation to the important role of the nurse with the child with microcephaly, lacking, to provide comprehensive and quality care, to improve and enrich their necessary technical knowledge about the disease, treatment and care that will guide a good prognosis in the progress of patients with the disease. (VEIGA *et al.*, 2017)

An efficient nursing assistance is able to reduce the impacts caused to parents and family, by seeking care provided to children with microcephaly, helping a better progress of family resourcefulness, improving the quality of life of both the child and his family. Nursing professionals should seek help from strategic means of

emotional support, making use of information and communication, such as therapeutic activities, thus collaborating with the strengthening of the family bond.

It is important that the professional promotes a bond of trust with the parents, which will allow moments of listening and welcoming that will favor the divided and organized structuring of child care. The team carries with it the duty to provide training to the family in the prevention of possible sequelae from microcephaly, creating technical care interventions, as well as performing direct and objective observations of children introduced into the family dynamics, cooperating as a source of support and affective of support them, reducing the obstacles caused by the disease. (FREITAS, 2018)

In the 4th stage, the study aimed to describe the knowledge of the professional nurse when monitoring the child with microcephaly. The results of this study identified that most children 2 (66.7%) are in uncovered areas, without follow-up with a professional nurse, only 1 (33.7%) regularly follow up with this professional, this result leads us to the fact that most children are not monitored by this professional, thus emphasizing the need for this service,

since the nurse is one of the main professionals in monitoring the child's growth and development, as he has his work focused on techniques that enable a adequate assistance for physical, motor and cognitive development. (VICTORINO, 2017)

IV. CONCLUSION

The results of this study lead us to conclude that sociodemographic factors can negatively influence the search for care for children with microcephaly, since they directly imply the means necessary for good assistance, where low education guides the lack of knowledge about the real needs of the child and the low income provides difficulties in the search for quality care in face of these needs. It was also observed that the results of this study are in line with the findings of other studies, so we hope that this study will stimulate the desire for new investigations on this subject, and that they can collaborate with the due importance and awareness necessary for health teams.+

REFERENCES

- [1] ABREU, Thais Titonel; Novais, Michelli Christina Magalhães; Guimarães, Isabel Cristina Britto. (2016). **Crianças com microcefalia associada a infecção congênita pelo vírus Zika: características clínicas e epidemiológicas num hospital terciário.** *Revista de Ciências Médicas e Biológicas*, v. 15, n. 3, p. 426-433.
- [2] BRASIL, Ministério da Saúde (Br). Secretaria de Vigilância em Saúde. (2015). **Protocolo de vigilância e resposta à ocorrência de microcefalia relacionada à infecção pelo vírus Zika.**
- [3] BRASIL, Ministério da Saúde (MS). (2016). **Protocolo de Vigilância e Resposta à Ocorrência de Microcefalia e/ou alterações do Sistema Nervoso Central (SNC) - Versão 2.1.**
- [4] CRUZ, Tainá A. R; SILVA, Flávia C.; SANTOS, Emanuele MS. (2017). **Perfil clínico, sociodemográfico e funcional dos lactentes com microcefalia atendidos no setor de terapia ocupacional de um centro especializado em reabilitação.**
- [5] CUNHA, Rivaldo Venâncio da et al. (2016). **Zika: abordagem clínica na atenção básica.**
- [6] DEMO, Pedro, 1941. (2000). **Metodologia do conhecimento científico/** Pedro Demo. – São Paulo: Atlas.
- [7] ESTRELA, Carlos. (2005). **Metodologia Científica – Ciência, Ensino, Pesquisa /** Carlos Estrela. São Paulo: Artes Médicas.
- [8] FREITAS, Alyne Aparecida Ferreira et al. (2018). **avaliação do impacto familiar em pais de crianças diagnosticadas com microcefalia pelo zika vírus.**
- [9] GIL, Antônio Carlos. (2008). **Como elaborar projetos de pesquisa.** 4. ed. São Paulo: Atlas
- [10] JUNIOR, Edivalder Nonato do Nascimento et al. (2017). **Perfil antropométrico e consumo alimentar de criança com microcefalia.**
- [11] MARINHO, Fatima et al. (2016). **Microcefalia no Brasil: prevalência e caracterização dos casos a partir do Sistema de Informações sobre Nascidos Vivos (Sinasc), 2000-2015.** *Epidemiologia e Serviços de Saúde*, v. 25, p. 701-712.
- [12] OLIVEIRA, Consuelo Silva; DA COSTA VASCONCELOS, Pedro Fernando. (2016). **Microcefalia e vírus zika.** *Jornal de Pediatria*, v. 92, n. 2, p. 103-105.
- [13] SALGE, Ana Karina Marques et al. (2016). **Infecção pelo vírus Zika na gestação e microcefalia em recém-nascidos: revisão integrativa de literatura.**
- [14] VEIGA, Suelia Aparecida; DOS REIS NUNES, Clara; ANDRADE, Cláudia Caixeta Franco. (2017). **Assistência DE ENFERMAGEM À CRIANÇA COM MICROCEFALIA.** *Múltiplos Acessos*, v. 2, n. 2.
- [15] VITORINO, Ana Beatriz Ferreira. (2017). **Crescimento e desenvolvimento da criança com microcefalia relacionada à transmissão vertical do Zika vírus.** Dissertação de Mestrado. Brasil.