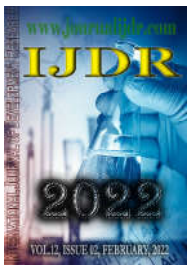
ISSN: 2230-9926

Available online at http://www.journalijdr.com

IJDR

International Journal of Development Research
Vol. 12, Issue, 02, pp. 53892-53894, February, 2022
https://doi.org/10.37118/ijdr.23997.02.2022



RESEARCH ARTICLE OPEN ACCESS

CHARACTERIZATION OF AEROMEDICAL TRANSPORTATION OF CHILDREN, FROM A PRIVATE COMPANY IN THE SOUTHEASTERN REGION OF BRAZIL

Vânia Paula de Carvalho[1]; Bruno Gonçalves da Silva[2,3]; Maria Eduarda Becho Arger Marchetti[4]; André Alves Elias[5]; Flávio Lopes Ferreira[1,3] and Armando Sérgio de Aguiar Filho[2,6]

[1]Federal University of Minas Gerais - UFMG Av. Pres. Antônio Carlos, 6627 - Pampulha, Belo Horizonte - MG, 31270-901; [2]FUMEC University - R. Cobre, 200 - Cruzeiro, Belo Horizonte - MG, 30310 – 150; [3]Faculty of Medical Sciences of Minas Gerais FCMMG - Alameda Ezequiel Dias, 275 - Centro, Belo Horizonte - MG, 30130-110; [4]Federal University of Minas Gerais - UFMG Av. Pres. Antônio Carlos, 6627 - Pampulha, Belo Horizonte - MG, 31270-901; [5]José do Rosário VellanoUniversity - São Miguel Street, 97 -Itapoã, Belo Horizonte - MG, 31710-350; [6]Faculdade Promove - Av. João Pinheiro, 164 - Lourdes, Belo Horizonte - MG, 30130-180

ARTICLE INFO

Article History:
Received 28th November, 2021
Received in revised form
17th December, 2021
Accepted 26th January, 2022
Published online 20th February, 2022

Key Words:
Aeromedical rescue; Nursing;
Neonatal intensive care unit;
Pediatric intensive care unit; Child.

Corresponding author:
Vânia Paula de Carvalho,

ABSTRACT

To analyze and categorize inter-hospital air transport of children performed by a private company, in the period 2020. Retrospective, quantitative, descriptive study. Data were collected from the electronic medical record system. Analyzed, categorized by age group, gender, diagnostic categories, presence of airway, and reason for transfer. Approved under opinion 4.831.047. Accomplished 153 aeromedical means of transport of children, 40 (26.14%) intubated. There were 94 pediatric (61.44%/153) and 59 neonatal (38.56%/153). The reason for transfer for complementary resources (139/90.84%) and repatriation (14/9.16%). Neonatal: median of 04 days, male gender (57.63%), predominance by prematurity (30.51%), and intubated (9.15%). In pediatrics: median of 02 days, female (51.06%), predominance for respiratory system diseases (36.17%) and intubated (17%). In both, the majority for complementary resources. Researchers emphasize that the transport of critical children should be performed by specialists.

Citation: ***Vânia Paula de Carvalho; Bruno Gonçalves da Silva; Maria Eduarda Becho Arger Marchetti; André Alves Elias; Flávio Lopes Ferreira and Armando Sérgio de Aguiar Filho.*** "Characterization of aeromedical transportation of children, from a private company in the southeastern region of Brazil", *International Journal of Development Research*, 12, (02), 53892-53894.

INTRODUCTION

Since the 18th century, when rudimentary methods were used to transfer the patient to a place with care resources, medical transport has kept evolving.[1] Thus, with the technological evolution of medicine it was possible to adapt vehicles to transfer safely, respecting the criteria of basic and advanced emergency transport. Those characterized as emergencies would count on a team trained in advanced techniques and adapted to vehicles of different types (ambulances, aircraft, and water).[2] In this context, inter-hospital transport is necessary when the hospital of origin does not have the physical, diagnostic, and/or human resources to treat the patient. Thus, the units of lower complexity commonly indicate complementary exams that are not part of the scope of specific procedures and/or of high complexity. [3] It is worth pointing out that, for ethical reasons, it is the responsibility of the physician to assist the patient to evaluate, diagnose, perform possible interventions, and decide the best time for the transfer. Also, consider the criteria of risk versus benefits.[1] It is necessary to remove the child when the place of origin has therapeutic limitations. Thus, the assistant physician indicates the transfer to another institution that has resources to perform the appropriate therapy, according to the previously identified diagnosis.[3] Given the above, air transport of critically ill children is an alternative to the lack of resources at the place of origin. Despite the high cost, limitations, geographical difficulties, and the need for highly specialized teams. It is justifiable to study the profile of children transported by air because, by categorizing the pathologies by the affected systems, identifying those that were transported by definitive airway and the reason for the transfer, the possibility of contributing to improving the quality of care in a hypobaric environment becomes more relevant. The objective of this work was to analyze and categorize the inter-hospital air transports of children performed by the private company in the period 2020.

METHODS

Study category: This is a retrospective, quantitative, descriptive study, obtained from the database containing the digital medical records.

Scenario: A private company providing air transportation services for critically ill patients, based at Pampulha Airport and located in Belo Horizonte, Minas Gerais, Brazil.

Population: The 153 children's digital medical records for the period January 1 to December 31, 2020.

Inclusion and Exclusion Criteria: All inter-hospital transports of children up to 12 years old in the year 2020 were selected. Excluded were those outside the period specified and those transported more than once during the period specified.

Data Collection: The data were collected from the Dedalus® electronic medical record system.[4] For this, it was enough to select the chosen period and the system generated the secondary database in an Excel® spreadsheet for the analyses.

Data Analysis: Data analysis was performed based on the database, categorized by age group: 0 to 28 days - neonatal, and above 29 days to 12 years - pediatric. Also, categorized by gender, diagnostic categories, evaluated the relative frequency of intubated children and the reason for transfer.

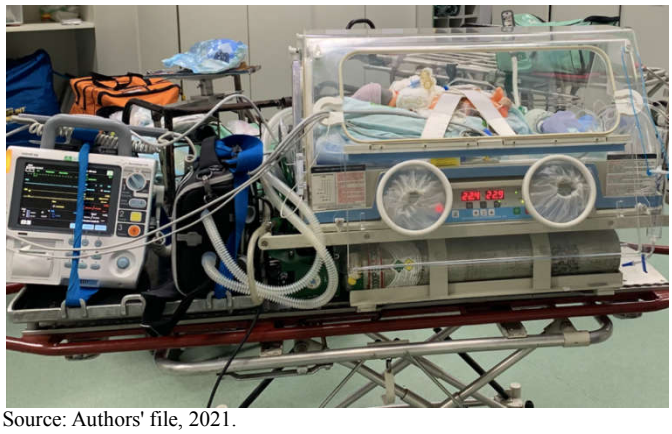
Ethical aspect: This study followed the guidelines expressed in Resolution MS 466/12 of the National Health Council, which presents the ethical standards for researching with human beings. It was approved by the Ethics and Research Committee (CEP) of the FaculdadeCiênciasMédicas de Minas Gerais, under CAAE: 48361321.8.0000.5134 and opinion 4.831.047.

RESULTS

A total of 153 air types of transport of children were performed between January and December 2020. A total of 94 (61.44%/153) pediatric and 59 (38.56%/153) neonatal children were transported. Furthermore, 40 (26.15%) children were transported intubated.[4] When analyzing the epidemiological profile of neonates, we have an age range with the median of 04, age in days. Male (34/57.63%) and female (25/42.37%). The diagnostic categories were classified as: prematurity (18/30.51%), followed by respiratory system diseases (17/28.81%), cardiovascular system diseases (12/20.34%), sepsis diagnosis (2/3.39%), central nervous system diseases (1/1.70%), and others (9/ 15.25%). A total of 14 neonates (9.15%) had an advanced airway.[4] When analyzing the pediatric epidemiological profile, we have: age range with the median of 02, age in years. Male (46/48.94%) and female (48/51.06%). The diagnostic categories classified as: respiratory system diseases (34/36.17%), followed by central nervous system diseases (22/23.41%), cardiovascular system diseases (11/11.70%), neoplastic diseases (7/7.45%), digestive system diseases (8/8.51%) and with the same rate the diagnosis of sepsis and others (6/6.38%). Twenty-six children in the pediatric age group (17%) had advanced airways.[4] Air transport is an important alternative when the child needs complementary resources or propaedeutics that do not exist at the origin. Of course, access is restricted, but usually, soon after the confirmation of the vacancy by the requesting physician, the specialized teams are activated for the mission. Thus, of the 153 types of transport carried out, the reasons for transfers in 139 (90.84%) were to get complimentary resources and 14 (9.16%) for repatriations.[1]Normally, sick children are transferred to hospitals in large centers for complementary resources that do not exist in the family's place of residence. When they are discharged, they need intensive support to return safely to their hometown. No transportation was repeated for the same child. [4] In this context, to carry out the air transport of children some particularities must be considered, such as: environment, indication, category of aircraft, age-specific materials/equipment, use of complementary resources, trained transport team, transfer to referral centers according to the complexity of the pathology and with this, possibly, there will be better outcomes, improved quality, and safety. [5]

DISCUSSION

Transportation must be a safe medical decision and evaluate the benefits versus the risks. It is indicated when there is a lack of therapeutic and/or diagnostic resources for the adequate treatment of the patient. Thus, there are different modalities of transport, specificities for each type, and the most common are intra-hospital and inter-hospital.[6] In this context, for the inter-hospital transport to take place, the physician at the patient's hospital of origin will make a vacancy at the destination hospital possible. For this, he/she should discuss the case with the physician of the destination hospital and check if there is a vacancy available. When discussing the case with the colleague, it must be clear the reason for the transfer, the protocols for performing the procedures, the specifics, and soon after confirmation, choose the most appropriate means of transport.[7] In addition, there are factors to be considered when choosing the mode of transport, such as: the distance, duration, the urgency of the situation, meteorological issues, logistical issues, possible clinical complications depending on the type of transport (air and/or land, or water), as well as the specific factors of each region in the country.[8] In the American authors' research on air transportation of children in fixed-wing aircraft, 82% pediatric and 18% neonatal patients were transported.[9]



Source: Authors' file, 2021.

Figure 1. Image record of the realistic simulation of neonatal air transport

This corroborates the data found, as it highlights the predominance of pediatric transportation and the need for advanced teams. In the Australian quantitative, large cohort study on long-distance inter-hospital transport of neonates with heart disease, there was a predominance of male children (68.75%/80), and 31% required mechanical ventilation.[10] Thus, the data was found to corroborate that of neonatal transport. Nevertheless, the articles cover the transport of children in a generalized or highly specialized way, which makes the analysis difficult and/or may cause biases. In another survey conducted in Northern Australia, nurses transported 646 children with an average age of 4.4 years. Respiratory illnesses were the most prevalent, in 31% of cases. As well as, a trauma in 11%, gastrointestinal problems in 10%, and other (infections) 17%. Of these transports, 25 highly complex neonates (83.33%) required ventilatory support.[11] The respiratory cases corroborate those found for pediatric children transport, with the highest predominance (36.17%). The categories are listed in the affected systems, the studies found are mostly described as clinical and traumatic. The median age in years suffers interference when including adolescents up to 16 years old in the sample. All researchers described those children, regardless of age, benefit from transportation performed by specialized teams. They also emphasized that the teams must be experienced in transporting critical children to maintain high performance and that they must take refresher courses and legal certifications. [9,10,11,12] The complexity of the processes and the paraphernalia used for neonatal air transport can be seen in the image record. The practice of high-fidelity simulation to train new team members Figure 1. There are challenges to be overcome in our

country with continental dimensions, there are heterogeneities of access to tertiary hospitals, especially children's hospitals. And the need for transfers to large centers is a reality. Therefore, it is evident the complexity of the processes to perform the air transportation of critically ill children, aligned to a trained team, and the need for specialized materials/equipment.

CONCLUSION

In the year 2020, 153 children were transported, with a predominance of the pediatric age group 94 (61.44%). For the neonatal age group, the majority of transports were male (57.63%), with a predominant diagnosis of prematurity (30.51%), and 9.15% were intubated. For the pediatric age group, the majority were female (51.06%), classified with a diagnosis of respiratory system diseases (36.17%), and 17% were intubated. Also, in both age groups, the reasons for transfers were for complementary resources. In this context, knowing the complexity of air transport of children, the particularities, the influence of the environment, can contribute to better outcomes in quality of care and safety. Meanwhile, it is necessary to conduct new studies that can contribute to the improvement of processes.

REFERENCES

Barker, C. L., & Ross, M. (2014). Pediatric aeromedical retrievals in the 'Top E nd'of the NorthernTerritory. *Australian Journal of Rural Health*,*22* (1), 29-32.

Carvalho VP, Pena CD, Pimenta FS, Lopes FL, Souza AAP, Castanheira CH. TransporteAeromédico. In: Santana JCB, Melo CL, Dutra BS. Prehospital Care: Basic and Specialized Procedures. 2018. Curitiba. CRV. (1) 631-649p.

Colyer, E., Sorensen, M., Wiggins, S., &Struwe, L. (2018). The effect of team configuration on the incidence of adverse events in pediatric critical care transport. *Air medical journal*, *37*(3), 186-198.

de Oliveira, C. H. M. C., da Silva, T. R. G., Oliveira, T. M., de Carvalho, F. B., & dos Reis Corrêa, A. 2021. Characteristics of care to trauma victims admitted to an emergency room via air transport. *Revista de Enfermagem do Centro-Oeste Mineiro*,*11*.

Dedalus. Unimed Aeromedica 2021. <http//:dedalus. unimedaeromedica.com.br> Login.aspx Subscription required [accessed 2021 Sep 19].

Dias, C. P., Ferreira, F. L., & Carvalho, V. P. D. (2017). The importance of teamwork in air patient transport. *Rev. enferm. UFPE online*, 2408-2414.

Dias, C. P., Silva, M. A. C., Santos, M. S., Ferreira, F. L., de Paula Carvalho, V., & Alves, M. 2021. The interdisciplinary team experiences of managing patient safety during a fixed-wing inter-hospital aeromedical transport: A qualitative study. *International Emergency Nursing*, *58*, 101052.

Gomes, M. A. V., Alberti, L. R., Ferreira, F. L., & Gomes, V. M. 2013. Historical aspects of aeromedical transport and aerospace medicine-review. *Rev Med Minas Gerais*, *23*(1), 116-123.

Gonçalves da Silva B, Lorrany Viana L, Faustino S de SF, Silveira C de PS, Carvalho VP de, Filho AS de A. Preparação do enfermeiro para o atendimento à múltiplas vítimas no resgate aéreo. Nursing (São Paulo). 2021 Jun 30;24(278).

Loyd, J. W., Larsen, T., & Swanson, D. (2021). Aeromedical transport. *Stat Pearls [Internet]*.

Paul, S., Resnick, S., Gardiner, K., & Ramsay, J. M. (2015). Long-distance transport of neonates with transposition of the great arteries for the arterial switch operation: A 26-year Western Australian experience. *Journal of pediatrics and childhealth*, *51*(6), 590-594.

Traiber C, Andreolio C, Luchese S. Inter-hospital transport of critically ill children. Scientia Médica. 2006;

****