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ORIGINAL ARTICLE

Assessment of Medical Team Knowledge on Sun Exposure and Neonatal Jaundice in a Hospital in Southern Brazil

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Abstract

Introduction: Sun exposure in the neonatal period for the reduction of jaundice is contraindicated by the Brazilian Society of Pediatrics. In addition to not being an effective form of treatment, it can lead to more severe consequences, such as skin cancer and sunburn. **Objective:** To assess the medical teams knowledge about sun exposure during the neonatal period, specifically in relation to reducing neonatal jaundice, and to provide participants with updated knowledge on the subject. **Method:** A observational, analytical, and cross-sectional study conducted from October 2020 to August 2021, based on a questionnaire administered to physicians of newborns in a maternity hospital in southern Brazil. **Results:** Regarding medical knowledge about sun exposure in the neonatal period, 24 (51.1%) physicians responded that the frequency of sun exposure should be daily, 17 (37.0%) believed that the best time for sunbathing was before 10 a.m. and after 4 p.m., 18 (38.3%) stated that the duration of exposure to sunlight should be 10 to 15 minutes, and 21 (44.7%) professionals indicated that there is no recommendation for such exposure. **Conclusion:** There is a misconception among some physicians regarding neonatal sun exposure, especially for reducing jaundice. Therefore, continuous medical education is essential.

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INTRODUCTION

Neonatal jaundice is a common condition in neonatology, affecting both full-term newborns (NBs) and premature infants. Elevated serum levels of total bilirubin, at the expense of indirect bilirubin (IB), can cause bilirubin to permeate the central nervous system, leading to irreversible neurological damage such as bilirubin encephalopathy (kernicterus). In addition to severe sequelae such as tetrads, severe athetoid cerebral palsy , and auditory neuropathy, it can also lead to death. Treatment is most often with phototherapy and rarely with exchange transfusion[1,2].

In most cases, neonatal jaundice is physiological, appearing within the first 24 hours of the newborn's life and lasting for approximately one week. It may be due to increased bilirubin production, immaturity of the intrahepatic bilirubin conjugation system, and increased direct bilirubin deconjugation in the intestine by beta-glucuronidase , all of which are physiological characteristics of the first days of life. Neonatal jaundice may also be associated with other causes such as low birth weight, delayed or ineffective breastfeeding, and pathological causes such as congenital infections, congenital hypothyroidism, G6PD deficiency, galactosemia, tyrosinemia, breast milk jaundice, Gilbert's syndrome and Crigler-Najjar syndrome , biliary tract malformations, among others[2-4].

It is known that sunlight has the ability to photoisomerize bilirubin (BI), facilitating its excretion. The blue band is the ideal wavelength for photoisomerization . Although sunlight includes the effective wavelength range of blue light, it also contains the harmful range of ultraviolet light[5]. Furthermore, infants and newborns have a thinner epidermal layer and lower melanin production and are therefore more susceptible to skin damage from ultraviolet radiation[6]. Given the possibility of reducing neonatal jaundice through sun exposure, when a newborn presents with jaundice without the need for phototherapy and is fit for discharge, maternal doubt arises about whether or not to expose the baby to the sun, a culturally common practice to reduce jaundice[7-10]. Excessive exposure to ultraviolet (UV) radiation in childhood can generate risks such as skin cancer and premature aging[11,12]. The Brazilian Society of Pediatrics (SBP) does not recommend direct sun exposure of newborns to treat hyperbilirubinemia , as it is ineffective and can cause skin damage in both the short and long term[13].

Some physicians have a tradition of exposing babies to the sun as a means of preventing and treating jaundice, especially for newborns who present with visible jaundice upon hospital discharge but lack the serum levels required for phototherapy. The objective of this study is to assess the medical team's knowledge of sun exposure in the neonatal period for the purpose of treating or preventing jaundice, while also assessing their knowledge of sun exposure during this period of life. Furthermore, it aims to provide participants with up-to-date knowledge on the subject.

METHODOLOGY

Observational, analytical, and cross-sectional study. Conducted from October 2020 to August 2021, approved under opinion number 37202220.00000.0120 on 12/09/2020 by the Research Ethics Committee. The study was conducted at a maternity hospital in southern Brazil, a reference hospital for the Itajaí-SC region, Brazil. The results were obtained based on a digital questionnaire addressed to physicians and sent to four maternity hospital teams in the southern region of the country. After completing the questionnaire, the physicians were given a folder containing information on appropriate sun exposure during the neonatal period, as well as guidance on the risks of jaundice. The results for quantitative variables were expressed as mean, standard deviation, median, minimum, and maximum. For categorical variables, frequencies and percentages were presented. The analysis of associations between two categorical variables was performed using the chi- square test. Values of $p<0.05$ indicated statistical significance. The data were analyzed with the *Stata /SE v.14.1* software package . *StataCorp LP, USA.*

RESULTS

A total of 49 physicians of both sexes were interviewed, 44 (89.8%) female and 5 (10.2%) male, with a mean age of 42.9 years (SD ± 9.2), and ages ranging from 27 to 63 years. Regarding the time since graduation in medicine, the mean was 17.5 years (SD ± 8.9), and the mean experience in maternity was 12.8 years (SD ± 10.3). Of those interviewed, 46 (93.8%) currently care for newborns and 3 (6.1%) answered no.

The 49 professionals interviewed had medical residency, completed between 1980 and 2021. Regarding medical knowledge about the risks of sun exposure: 48 (98.0%) of the doctors think that the risks are sunburn, 46 (93.9%) believe that the risks are the development of skin cancer, 43 (87.8%) premature aging, 31 (59.2%) dermal erythema and 1 (2.0%) responded that metabolic and genetic diseases are a risk.

Regarding the benefits involved in sun exposure, 47 physicians were questioned: 100% believe it is important for the synthesis of vitamin D, 41 (87.2%) believe it is responsible for the generation of well-being, 28 (59.6%) believe it favors the reduction of bilirubinemia, 23 (48.9%) reported it is responsible for the production of β-endorphins, 21 (44.7%) believe it is important for brain serotonergic activity, 14 (28.8%) believe it is responsible for dermal strengthening. Regarding the indications for sun exposure in the neonatal period: 24 (51.1%) believe it is responsible for the prevention of hypovitaminosis D, 17 (36.2%) stated it is indicated for the treatment of neonatal jaundice, and 13 (27.7%) believe there is no indication for exposing the newborn in the neonatal period. For those who recommend sun exposure, the question was asked about the recommended exposure time during the

neonatal period: 22 (29.3%) believed that sun exposure was necessary every day, 23 (56.1%) believed that the best time to sunbathe was before 10 am and after 4 pm. Regarding guidance regarding the duration of sunbathing, 22 (47.8%) indicated that it was on average 10 to 15 minutes, and 12 (26.1%) believed that the newborn should remain in the sun for at least 10 minutes.

When analyzing newborns with jaundice without indication for phototherapy, what would be the discharge guidance regarding sun exposure habits: 24 (51.1%) doctors responded that the frequency of sun exposure should be every day, 17 (37.0%) think that the best time for sunbathing is before 10 am and after 4 pm, 18 (38.3%) stated that the time spent in the sun's rays should be 10 to 15 minutes and 21 (44.7%) professionals think that there is no indication for such exposure.

DISCUSSION

Assessing the medical team's knowledge about sun exposure to reduce neonatal jaundice is important, as jaundice is common in neonatology, and excessive sun exposure in childhood poses risks such as skin cancer, premature aging, and sunburn[11,12]. According to the Brazilian Society of Pediatrics (SBP) photoprotection manuals, newborns should not be exposed to the sun to prevent or treat neonatal jaundice[13], as the harmful effects, especially long-term effects such as skin cancer, outweigh the benefits[11,12]. Studies reveal that solar radiation, for example, can cause DNA mutations , although the body has repair mechanisms for such damage in pathologies such as xeroderma. pigmented this repair is defective and insufficient[14,15].

It is estimated that two-thirds of melanoma cases result from excessive sun exposure in the first 15 years of life[16], highlighting the importance of protecting children from the sun to prevent skin cancer[17-19]. Despite the risks of sun exposure, there are also several benefits, such as: vitamin D synthesis, well-being, beta-endorphin production, brain serotonergic activity, folic acid degradation, immunomodulation, and circadian clock control. However, this exposure should follow expert guidelines[20]. Obtaining vitamin D through sun exposure is also not recommended in the neonatal period, for the same reasons[13].

Advising jaundiced newborns on sun exposure was a common practice among some physicians, even though they were aware of the risks to the baby's skin revealed at the beginning of the questionnaire. This is likely due to outdated cultural practices, which should be changed through continuing medical education. The study is not limited to the region studied, but rather to the federation, as a survey conducted in Montes Claros, Minas Gerais, on the development and validation of an instrument to assess the knowledge of general practitioners and pediatricians about photoprotection and solar radiation revealed that 90% of physicians were aware of the relationship between excessive sun exposure and skin cancer, as well as the importance of primary prevention in efforts to combat melanoma[21].

The sample studied has professional experience in newborn care and demonstrates the growth of the female physician population compared to the male population in pediatrics. According to 2018 SBP data, it is estimated that women already accounted for approximately 73.9% of the specialty in the country, while men accounted for 26.1%[22].

Regarding medical knowledge about the risks of exposing newborns to the sun: 48 (98.0%) responded that sunburn was the main risk, followed by skin cancer with 46 (93.9%) and premature aging with 43 (87.8%), demonstrating knowledge on the subject, especially with regard to long-term neoplastic dermal disease.

Regarding the benefits of sun exposure, obtaining vitamin D was unanimous, and 24 (51.1%) of the doctors reported that one of the indications for exposing newborns to the sun would be to prevent hypovitaminosis D. It is known that the sun is indeed a source of vitamin D, however, the correct way to prevent hypovitaminosis D in the neonatal period is through oral administration of the vitamin, because the risks of exposure are greater than the benefits[23,24].

Pediatricians are professionals with significant educational power for the population, and photoprotection is a topic that should be addressed during well-child visits. This study may have had some limitations, such as the small number of physicians interviewed and the predominantly coastal population studied, which may affect habits and customs. It was possible to compare data with data from other locations in Brazil, but these are scarce. Further studies in other regions of the country are essential to compare data from other populations.

Some physicians' knowledge gaps regarding sunbathing and jaundice were observed, believing that exposing newborns to the sun could reduce the problem, demonstrating a lack of knowledge on the subject on both sides. Phototherapy is the only current and effective standard treatment for neonatal jaundice. Furthermore, sun exposure is contraindicated due to the harmful effects of the sun, which can lead to skin cancer over time. Therefore, it is necessary to inform and educate physicians, as well as the general population, about the harmful effects of sun exposure during the neonatal period.

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