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REVISIONES

Pediatric trauma and its relation to social health determinants

Traumatismo en pediatría y su relación con los determinantes sociales de la salud

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Keywords: Trauma; Pediatrics; Social heath determinants.

Palabras clave: Traumatismo; Pediatría; Determinantes sociales de la salud.

ABSTRACT

Background: Trauma represents in Chile and in the world, the major cause of death in children, adolescents and young adults; and is one of the most important causes of morbidity. It is a significant public health problem, because its consequences are transcendental in magnitude and impact.

Objective: To identify the Social Health Determinants (SHD) that impact trauma in children, describe the relationship between the SHD identified, and propose comprehensive strategies to lessen the impact.

Methods: A literature review was made from Medline/Pubmed, Lilacs, ProQuest, Cinhal and Scielo, between October 2011 and January 2012. Selected for analysis were 15 articles that met the inclusion criteria.

Results: The SHD that are related to the incidence and severity of trauma in children are: education and literacy, socioeconomic status, and physical environment. These can cause a positive or negative impact on the health of children with regard to morbidity and mortality from external causes.

Conclusion: To reduce the trauma of children in Chile, it is essential to educate the population. Educational programs should be designed and implemented by multidisciplinary teams in coordination among sectors, taking into account the social determinants of health involved, such as low educational level, low socioeconomic status and inadequate physical environment; also considering the ability of people to access and understand the information given by health professionals.

RESUMEN

Antecedentes: Los traumatismos representan en Chile y el mundo, la principal causa de muerte en niños, adolescentes y adultos jóvenes, y es una de las causas más importantes de morbilidad. Es un

problema relevante de salud pública, debido a que sus consecuencias, son trascendentes en magnitud e impacto.

Objetivo: Identificar los DSS que tienen impacto en el traumatismo en pediatría, describir la relación entre los DSS identificados, y proponer estrategias globales para disminuir el impacto.

Metodología: Revisión bibliográfica, se realizó una búsqueda en las bases de datos Medline/Pubmed, Lilacs, ProQuest, Cinhal y Scielo, entre los meses de octubre 2011 y enero 2012. Para el análisis fueron seleccionados 15 artículos que cumplían con los criterios de inclusión.

Resultados: Los determinantes sociales de la salud que se relacionan con la incidencia y la severidad del traumatismo en pediatría son: educación y literacidad, ingreso y status social, y ambiente físico. Los cuales pueden causar un impacto positivo o negativo en la salud de la población infantil con respecto a la morbimortalidad por causas externas.

Conclusión: Para prevenir el traumatismo infantil en Chile, es indispensable educar a la población. Los programas educativos deben ser diseñados por equipos multidisciplinarios e implementados en forma intersectorial; teniendo en cuenta los determinantes sociales de la salud involucrados, tales como: bajo nivel de escolaridad, bajo nivel socioeconómico y ambiente físico inadecuado; considerando además, la capacidad de las personas para acceder y comprender la información otorgada por los profesionales de la salud.

INTRODUCTION

Trauma represents in Chile and in the world, the major cause of death in children, adolescents and young adults; and is one of the most important causes of morbidity. It is a significant public health problem, because its consequences are transcendental in magnitude and impact in terms of human suffering, remarkable social and economic costs for the family, the state and private health organizations, as well as the physical and psychological disabilities that affect the victim and their environment [1-6].

In Chile, deaths from external causes are the fourth leading cause of death in the general population, after circulatory system diseases, tumors and respiratory system diseases. During 2009, external causes were responsible for 8,151 deaths, from which 2,105 were traffic accidents, 115 were transport accidents, 2,148 were intentional self-inflicted injury and 3,783 were other external causes [7].

In the pediatric population, during the same year, trauma, poisoning and other external causes consequences (S00-T98 code ICD-10 classification), were responsible for 159,653 of hospital discharges in children between the ages of 0 to 4 years, 11,807 between 5 to 9 years, and 9,130 in adolescents between 10 to 19 years [7].

In UC Clinical Hospital, during 2008 and 2010, 398 patients younger than 15 years old were hospitalized with trauma diagnosis. Of these, 58.8% were male, with a mean age of 6.5 years (± 4.3 years). 47.2% were admitted for fracture, 15% for intoxication or poisoning, 9.3% for stab wounds, 6.5% foreign body, 2.3% for burns, and 20% for other injuries. Hospital stay was 2.0 (± 3.9 days). 84.4% had Isapre (Private health coverage) as health insurance, 11.6% Fonasa (Public health coverage), and 4% others (agreements, Armed Forces, particular). 94% were resident in the Central Zone of Chile, 3.5% in the South Zone and 2.5% in the North Zone [8].

The objectives of the present review are: to identify the SHD that impact pediatric trauma, to determine the relationship between the identified SHD, and to propose strategies to reduce the impact.

The purpose of the study is to contribute to the knowledge of pediatric health professionals, and to raise awareness about the important role they play in planning and developing prevention strategies of pediatric trauma.

METODOLOGY

For the present literature review, a search was performed in databases: Medline/Pubmed, Lilacs, ProQuest, Cinhal and Scielo, from October 2011 to March 2012.

Keywords used were: Trauma; Pediatrics; Children; Risk Factors.

The inclusion criteria for article selection was original research and literature reviews in Spanish, Portuguese and English, with a publication period not exceeding 10 years.

For the analysis, there were 15 articles selected that met the inclusion criteria.

The articles analysis will first identify the SHD that impact pediatric trauma, then determine the relationship between the identified SHD. Finally it will propose strategies to reduce the impact.

SHD THAT HAVE IMPACT IN PEDIATRIC TRAUMA

Social Health Determinants

Social Health Determinants are defined as *"those social conditions in which the life of people is developed, and that affect health status of population in different degrees"* [9]. This alludes to the specific features affecting the social context, as well as the mechanisms by which these conditions result in health impacts [10].

In 1996, Health Canada, from the health promotion paradigm, considered it important to address the whole set of potentially modifiable health determinants, not only those related to the actions of individuals, such as behavior and lifestyles; but also determinants such as income and social status, social support networks, education, employment and working conditions, social environment, physical environment, personal health practices and coping skills, healthy child development, biology and genetics endowment, health services, gender and culture [11].

The study of these determinants, takes vital importance when considering the problems of our population. Such is the case of trauma, considered an important public health problem due to its size and impact, being the leading cause of death in pediatric patients older than 1 year old and one of the leading causes of serious disability in childhood [12-13].

Risk factors for pediatric trauma incidence and severity

There are international studies that identify risk factors for the incidence and severity of trauma in child populations [14-17].

In North America, the highest rates of trauma areas were identified and characterized in 9 cities and counties in the United States and Canada, finding that factors

associated with higher rates of serious injury to be: unemployment, lower levels of education and low socioeconomic status [14].

In Colombia, risk factors for accidents were studied in 1,185 children who went to the Children Polyclinic of Medellin, finding that the major risk factors are: school age (6-10 years old), male gender, low socioeconomic status, unemployment, housing characteristics and lack of protection on stairs and terraces, and poor adult supervision[15].

In Bolivia, risk factors for accidents were identified in 600 children treated at a Pediatric Hospital in La Paz, finding that the main risk factors are associated with the mother's job away from home, and house characteristics such as: lack of security elements (gates, railings, protections) and dangerous products at the reach of children (hot products, volatile products, sharp objects, fireworks, plastic bags, cosmetics, cleaning products and medicines) [16].

In Spain, factors related to the severity of trauma were analyzed in 79 polytraumatized children admitted to an University Hospital in Madrid, finding that factors associated with higher severity of trauma are motor vehicle crashes (automobiles and hit-and-runs), and non-use of restraints in the car [17].

According to literature, social health determinants related to the incidence and severity of trauma in children are: education and literacy, income and social status, and physical environment. These can cause positive or negative impact in the health of children population in relation to morbidity and mortality from external causes [14-17].

RELATION BETWEEN THE IDENTIFIED SHD

Identified SHD definition

Education and literacy: Education increases choices and available opportunities, increases work assurance and satisfaction, improved "health literacy", increases financial assurance and gives people the necessary skills to identify and solve individual and group problems [11]. Health literacy is defined as the *"ability to read and understand medication instructions and other health care related information, in order to succeed as a patient"* [8].

Income and social status: Income and high social status acts as a shield against disease, as people have the ability to acquire adequate housing, food and other basic needs, to make choices and feel more in control over decisions in life. This feeling of being in control is essential for good health [11].

Physical Environment: The physical environment affects health directly and indirectly, because good health requires a sustainable environment, access to good quality of water, air and food. Manmade environments as the type of housing, community and workplace safety, and road design, are also relevant factors [11].

Interrelation between the identified HSD

The level of education of people who care for children, socioeconomic conditions and physical environment, are the three social determinants that have the greatest effect on the development of an accident [19-20]. The lack of education of parents and

caregivers generates a deficit in knowledge regarding the prevention of accidents; moreover, it increases the chances of resorting to precarious jobs with low incomes, which expose infants to inadequate housing conditions not suitable for their development and growth. Overcrowding and lack of suitable safeguarding of dangerous products is also a factor[19].

Identifying the involved elements which facilitate, predispose and even aggravate childhood accidents is of vital importance when developing preventive strategies [19]. For this reason, preventive efforts should be focused primarily in stimulating and developing behaviors aimed at improving knowledge and changing attitudes in the family nucleus.

STRATEGIES TO REDUCE THE IMPACT

There are strategies to reduce the impact of pediatric trauma at national and international levels [4-5, 21-22].

At international level

The United States have implemented successful intervention programs, applying certain preventive models, showing a significant reduction of 30% approximately of mortality as a result. For example, the use of appropriate seats in terms of design and placement for small children in vehicles that transport them, has influenced an estimated lethality decrease of 69% among infants and 47% among older children[5].

In Argentina, an educational program called VAPLE strategy (Vaccine Injury Prevention) was designed matching educational interventions with the National Vaccine Plan schedule. This program began with newborns' discharge and was extended to every stage of childhood and adolescence. They concluded that the used methodology helps to improve knowledge and behavior of populations in terms of accident prevention. The areas that showed greater difficulties are related to misconceptions regarding children monitoring and unsafe behaviors regarding electrical accidents protection and the use of car safety seats [22].

At national level

In Chile, the interventions for trauma prevention are clustered into three main groups: promoting change through education, persuasion, or younger children protection; foster risk environment modifications and stimulate involved structure and engineering changes; offering laws that strengthen preventive measures, reducing risks, monitoring the compliance with laws and regulations and/or that offenders are sanctioned accordingly [5].

Among the health objectives for the 2000-2010 period, the Health Ministry includes increasing treatment coverage in intensive care units of polytraumatized patients, and also implementing intersectoral programs of trauma and poisoning prevention. In addition, through the GES guarantees plan, it is expected to guarantee an integral intensive care management, as well as timely and quality health care attention to polytraumatized patients, including proven effective benefits, provided by qualified professionals and institutions [4].

One of the thematic areas in the 2011-2020 National Health Plan for reaching the Health Objectives is to prevent and reduce morbidity, disability and premature death from chronic non-communicable diseases, mental disorders, violence and trauma [21].

CONCLUSION

With the present literature review, we can conclude that population education is an imperative in preventing pediatric trauma in Chile. However, it is also necessary to regulate other areas, like: the use of engineering resources and street design; control and monitoring of environmental safety; and the appropriate legislative and judicial formulations to provide the necessary protection to the child population [5].

Health professionals are responsible for stimulating and developing behavior aimed at improving knowledge, changing attitudes, practices and lifestyles, both in our patients as well as in their families; considering the different risk factors present in children according to their sex, age and psychomotor development.

To achieve this, educational programs should be designed by multidisciplinary teams and implemented in an intersectoral way, taking into account the involved social health determinants, such as: low educational level, low socioeconomic status and inadequate physical environment; also considering the ability that people have to access and understand the information provided by health professionals.

These educational programs should be implemented from prenatal care to parents' diagnoses, evaluating their socioeconomic status, knowledge towards the issues and self-care capabilities, in order to know if they are in conditions to take trauma preventive measures before birth.

Preventive measures should be appropriate to the socioeconomic status of the family, to ensure that the lack of resources would not be an obstacle; therefore, it should be legislated to control prices for car seats, which are quite expensive, but have a significant impact in reducing serious injury from a collision [5].

The importance the effect of media communication has as an information source should be noted, so as to use this resource to disseminate injury prevention measures on a large scale.

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