

## BRIEF REPORTS

## Adult-worn child carriers: a potential risk for injury

Stephanie J Frisbee, Halim Hennes

### Abstract

**Objectives**—To examine and describe types of injuries associated with adult-worn child carriers and illustrate the need for careful use of these products by parents.

**Methods**—A literature search for the terms infant carriers, backpack carriers, infant slings, baby carriers, and baby slings was conducted. Information was also obtained and tabulated from the three Consumer Product Safety Commission databases: the National Electronic Injury Surveillance System (NEISS), the In-Depth Investigations File, and the Injury/Potential Injury Incident File.

**Results**—No reports of injuries were found in the medical literature. In the NEISS database, 51 injuries were reported between January 1990 and September 1998. Of these injuries, 38 (74.5%) were head traumas and eight (15.7%) were facial trauma. Of the 51 injuries, 11 (22%) required hospitalization.

**Conclusions**—Based on the data presented in this paper, injuries associated with the use of adult-worn child carriers appear to come from three general sources: product appropriateness and design, product condition, and product use. It is important for health care providers to assist in the dissemination of information regarding the safe use of these products to parents in an effort to prevent injuries.

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Keywords: backpack carriers; infant carriers; infant slings; Consumer Product Safety Commission

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In recent years, adult-worn child carriers have become popular. These carriers, usually made of a cloth material and worn on the front or back in “backpack” style, allow parents to maintain close contact with their child while retaining use of both hands. Additionally, these carriers eliminate the need for the use of strollers. There is also some evidence that use of adult-worn child carriers may promote more secure emotional attachments between the infant and parent.<sup>1</sup>

Since 1997, the Consumer Product Safety Commission (CPSC) in the United States has announced recalls of several models of adult-

worn child carriers for potential dangers including faulty straps and harnesses and wide leg openings.<sup>2</sup> We are not aware of any attempt to describe injuries related to the use of adult-worn child carriers in the medical literature. The purpose of this paper is to examine and describe such injuries by reviewing available data from the CPSC. These data are presented to illustrate the need for careful use if these products by parents and caregivers.

### Methods

A literature search of the databases Medline (1985–98), Health Source Plus (1984–98), and Academic Search Elite (1980–98) was performed. Search terms used, including variants, were: infant carriers, backpack carriers, infant slings, baby carriers, child carriers, and baby slings.

Information was also solicited from the CPSC. The CPSC is an “independent federal regulatory agency created to protect the public from unreasonable risks of injuries and deaths associated with some 15 000 type of consumer products”.<sup>3</sup> As part of their consumer protection mandate, the CPSC maintains three databases: (1) the National Electronic Injury Surveillance System (NEISS), a database containing injury statistics from a sample of hospitals that are statistically representative of hospital emergency rooms nationwide, (2) the In-Depth Investigations File (INDP), a database containing summaries of reports and investigations surrounding a product related injury, and (3) the Injury/Potential Injury Incident File (IPII), a database of hotline reports, product related newspaper accounts, reports from medical examiners, and letters about accidents involving consumer products. These databases were searched using the terms baby carriers, slings, and backpacks. The narrative description of each case captured by the search was reviewed. Data from appropriate cases from January 1990 to September 1998 were included in the analysis.

### Results

No reports of injuries associated with the use of adult-worn child carriers were found in the peer reviewed medical literature. Analysis of data received from the CPSC revealed 75 cases in the NEISS database. Fifty one of these

Table 1 Type of injury stratified by injury location for all injuries in NEISS database

Location	Type of injury						Total (%)
	Concussion	Fracture	Laceration	Abrasion	Hematoma	Other	
Head	17	7	1	13	0	0	38 (74.5)
Face	0	0	0	6	1	1	8 (15.7)
Upper extremity	0	0	0	1	0	0	1 (2.0)
Trunk	0	0	0	1	0	0	1 (2.0)
Lower extremity	0	1	0	1	0	0	2 (3.9)
Other	0	0	0	0	0	1	1 (2.0)
Total (%)	17 (33.3)	8 (15.7)	1 (2.0)	22 (43.1)	1 (2.0)	2 (3.9)	51 (100)

reported cases (68%) were included in the analysis; the remaining 24 cases were excluded because they reported injuries from unrelated products. The IPII included 34 reports with injuries. Hazards and modes of injury included: cloth tearing, zippers coming undone or separating, hooks or fastening rings breaking, infants falling through leg openings, straps breaking, stitching unraveling, clasps or brackets breaking, and parents falling while carrying their child. The INDP reported six investigations. The most common type of injury investigated was a skull fracture sustained after an infant less than 6 months of age fell through the leg openings of a front style carrier, some despite using the restraining straps.

In the NEISS database, 31 patients (61%) were boys and the mean age was 7.6 months (95% confidence interval 5.7 months to 9.4 months). The types and location of injuries are summarized in table 1. Injury to the head was noted in 38 patients (74.5%) and 16.7% of the patients had facial trauma. Lacerations and abrasions were reported in 45.1% of the patients and 33.3% had concussions. While the CPSC NEISS database reported no deaths in children injured in adult-worn child carriers, nearly 18% of all injured children required hospital admission and almost 4% of patients required transfer to another medical facility for treatment (table 2).

### Discussion

Difficulty in obtaining accurate estimates of product related injury rates from the CPSC NEISS database has been documented in the literature.<sup>4</sup> Because it is unclear if these problems can be adequately corrected using statistical techniques, it was not our purpose to estimate the number of injuries or injury rate associated with adult-worn child carriers. Rather, we have attempted to demonstrate, through the examination of CPSC database

information, the need for careful use adult-worn child carriers.

Injuries associated with the use of adult-worn child carriers appear to come from three general sources: product appropriateness and design, product condition, and product use. Injuries associated with product appropriateness have resulted in the recall of several models in recent years.<sup>2</sup> Injuries may result from poorly designed harnessing mechanisms, leg openings that are too large, or the infant may simply be too small to be safely placed in an infant backpack carrier. Most product specific instructions include weight based guidelines. However, in young infants especially, weight is only a crude proxy for size and strength. Consequently, although caregivers may be using the product according to the instructions, the infant may still not have sufficient size or strength to be safely transported in a given model. On the other extreme, infants may be too large, heavy, or strong for a specific model, leading to zippers, fasteners, or straps that may break or come undone and the infant falling.

Injuries resulting from the product's condition may include old or ill repaired carriers whose straps, zippers, snaps, fabric, or fasteners break, tear, or otherwise come apart resulting in the infant falling. Caregivers must be fastidious in assuring that their carriers are in good condition and all rips, tears, or loose zippers and straps are repaired using appropriate materials of sufficient durability. Special attention must be given to secondhand or used carriers.

Injuries can also result from the manner in which the product is used. For example, an action as benign as removing the carrier can lead the carrier strap breaking and the infant falling. Caregivers must be mindful of the physical and structural limitations of the carrier. Injuries can also result when the adult carrying the child falls or trips, resulting in the infant being thrown or falling from the carrier. The risk of adult falls and trips increase, obviously, with the difficulty of the activity the adult is performing.

Because of the height of falls and surfaces on which infants land, injuries associated with the use of adult-worn child carriers can be potentially serious. The majority of injuries reported in the NEISS database were head injuries, and 22% of all injuries required hospitalization. Currently there are no industry standards or regulations—mandatory or voluntary—governing the manufacture of infant backpack carriers, though each carrier

Table 2 Patient outcomes stratified by injury location for all injuries in NEISS database

Location	Patient outcome			Total (%)
	Treated or examined and released	Treated and transferred to another hospital	Treated and admitted	
Head	29	1	8	38 (74.5)
Face	8	0	0	8 (15.7)
Upper extremity	1	0	0	1 (2.0)
Trunk	1	0	0	1 (2.0)
Lower extremity	1	1	0	2 (3.9)
Other	0	0	1	1 (2.0)
Total (%)	40 (78.4)	2 (3.9)	9 (17.6)	51 (100)

comes with its own warnings and instructions for use. While industry regulations are in the process of being developed, it may be years before they are in place and being enforced (personal communication with the CPSC Compliance Office, 1999; personal communication with the Juvenile Products Manufacturers Association, 1999).

In order to prevent injuries, it is important to educate caregivers about ways to most safely use adult-worn child carriers. Many consumer organizations publish information guides and pamphlets on infant and child products for parents. For example, the CPSC publishes *The Safe Nursery* and it is available on the CPSC web site or directly from the CPSC.<sup>5</sup> Many parenting books also contain safety information and these public sources of information will, undoubtedly, continue to be important in the safety education of parents and caregivers.

Additionally, pediatricians, primary care providers, other health care professionals, and professional caregivers currently do and must continue to play an important, central part as a source of reliable, accurate information to assist in the education process of parents.

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#### **Crash site tributes to become fixtures**

Memorials to the victims of fatal road accidents are set to become a permanent fixture at the side of roads in Barnsley, South Yorkshire. In response to the increasing practice of grieving relatives and friends placing flowers and other makeshift reminders at the accident scene, councillors in the town agreed to allow individual plaques to mark the sites. Ten people a year on average die on roads in Barnsley. The council would enforce guidelines about the style of permanent plaques and they would be limited to 1 ft by 8 in and fixed to the nearest wall or fence, if the owner agrees, or set flush in the ground. The bereavement counselling group Cruse said, "Anything that helps the bereaved come to terms with their loss would be helpful for them" (*Daily Telegraph* (London), July 1999).

#### **A safer journey to school**

A guide launched in the UK details measures that can be taken to provide safe routes for children to walk and cycle to school. Mr Clarke, the schools minister, said that more than one million children are driven to school by car. According to Transport 2000 fewer than one in 10 seven year olds makes their own way to school compared with seven out of 10 in 1971. In one school in Herefordshire, where a "walking bus" has been introduced, the number of children walking to school has gone up from half to 80%, cutting congestion at the school and making the entrance to the school a safer area (*Daily Telegraph* (London), July 1999).

#### **Car gadgets in sales fast lane**

According to research by market analyst Mintel, spending on knick-knacks for the car has increased in real terms by 14% since 1994. One third try to beat the fumes with air fresheners, one in 10 has a car memo pad, and 5% display ornaments to brighten up their surroundings. While spending of this sort has grown, sales of tools and safety equipment have slumped. Fewer than a third of drivers keep jump leads in their cars and less than a quarter a foot pump. Apart from child seats where needed, British motorists are not required by law to carry any safety or emergency items in their cars, unlike many other European countries, where first aid kits and warning triangles are compulsory. Mintel says the market for safety accessories is unlikely to show much growth unless there is a millennium baby boom! (*Mail on Sunday* (London), July 1999).



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### References

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