Preventing foreign body injuries in children: a key role to play for the injury community

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Despite the improvement and diffusion of prevention rules, aspiration and ingestion of foreign bodies remain common events in pediatric patients, which can have severe, even fatal, consequences. Children 1–3 years of age are the most common victims of this class of injuries.[1] In this age range, children have a tendency to explore the world using their mouth, but they have immature swallowing coordination and underdeveloped neuromuscular mechanisms for airway protection. Moreover older infants develop incisor teeth before the molars, which enable them to bite and detach morsels of solid food that they are unable to crush.

An important advance in the prevention of injuries was the introduction of safety rules for toy design that require toys containing small parts be sold with a warning that they are not suitable for use by children under the age of 3.[2] This has reduced the frequency of injuries due to toys to below 3–4% in Europe and North America.[1 3]

Nevertheless, there are reasons why the injury prevention community should continue to give attention to this threat. Firstly, some commonly used objects, both food and non-food, have not shown a steady decline in choking incidence over the last few decades: this is the case for hot dogs and peanuts, the latter representing about 60% of overall choking injuries. Secondly, new threats related to specific classes of product are coming to the attention of researchers, requiring specific efforts to develop appropriate prevention rules to reduce the incidence and consequences to children's health. Thirdly, the burden to the healthcare system due to foreign body injuries is substantial, suggesting that activities to reduce incidence rates can be paid for by a reduction in overall healthcare expenditure.[4]

SPECIFIC THREATS

Some foreign bodies deserve special attention because of their potentially harmful effect and the need for prompt removal. Batteries, for electronic devices and toys, are emerging as one of the most dangerous foreign bodies.[3] The button battery is a single cell and is used to power hearing aids, photographic equipment, digital watches, toys, and other electronic devices. These cells generally contain a heavy metal, such as mercury, silver, and lithium, and a strong hydroxide of sodium or potassium. Although they are sealed, leakage of these corrosive substances is not uncommon, and when they remain in the gastrointestinal tract, mucosal damage with ulceration, perforation, or stricture formation can ensue. Retrieval should be performed within 8–12 h to avoid the risk of perforation. Families should be made aware of the consequences of ingesting batteries and of the need for prompt referral to emergency services to avoid unnecessary complications.

Ingested dried vegetables, especially beans and peas, and nuts swell and stimulate an inflammatory reaction within a few hours with the risk of asphyxia, making extraction extremely difficult. Ingestion of sharp and pointed objects represents an emergency because of the risk of esophageal perforation. The introduction of a warning on packaging of such items should be considered to help to reduce event rates attributable to them.

Magnets in the gastrointestinal tract can strongly attract each other with the potential to cause perforation, fistula, ulceration, and even death. Most complications can be attributed to either a delay in patient referral or inappropriate diagnosis. The problem is the non-specificity of the symptoms, which are often identified as a flu-like syndrome. Thus, it is an absolute priority that information is directed toward families and emergency doctors to avoid unnecessary delays in both patient referral and diagnosis.

ROLE OF FAMILIES IN PREVENTION

The European Registry of Foreign Body Injuries[5] has shown that incorrect or distracted adult supervision is commonly a cause of the injury mechanism. In the Susy Safe database, a parent or a care giver was present in ~49% of cases of injury, and it is interesting to note that the child was eating in 34% and playing in 59% of the cases; this suggests that an informative campaign directed toward families, stressing the importance of active attention when a young child is manipulating objects, would be useful.

TECHNIQUES FOR FOREIGN BODY REMOVAL

There is increasing evidence that appropriate endoscopic treatments reduce the consequences of foreign body injury.[6] This fact, along with evidence that a steep learning curve exists in the use of such techniques, suggests centralization of care for these potentially lethal injuries. This, however, is in contrast with the need for prompt removal of the foreign body. A possible solution is the creation of a network of specialized centers that can be quickly accessed in the same manner as organ transplantation and trauma care are organized.

FINAL REMARKS

In the field of prevention of foreign body injury, a multi-disciplinary approach is the only one to have efficacy, addressing the problem from the point of view of product design and engineering, product marketing and advertising, regulatory aspects and development of clinical post-trauma guidelines for treatment. There is also a role for dissemination of information to families and schools. Injury organizations such as ISCAIP should develop connections with other societies and research groups working in each of these fields, aiming to align activities and initiatives toward reducing incidence rates and consequences to children's health.

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