Study finds emergency department visits by children associated with water beads more than doubled from 2021 to 2022

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Researchers from the Center for Injury Research and Policy and Central Ohio Poison Center at Nationwide Children's Hospital have found more than an estimated 8,000 visits to U.S. emergency departments (EDs) associated with water beads from 2007 through 2022, and the number of these visits increased rapidly by more than 130% from 2021 to 2022.

In a study published in *American Journal of Emergency Medicine*, researchers analyzed 16 years of data and call for a more comprehensive regulatory approach to prevent water bead-associated injuries. The increase in ED visits occurred despite product recalls and the current ASTM F963-23 voluntary toy safety standard, indicating that current prevention strategies are not sufficient.

Water beads are made from superabsorbent material that can swell to hundreds of times their original size when exposed to fluids. They are commonly sold as child sensory products, gel projectiles for toy "gel blaster" guns, and decorations. If swallowed, they can expand in the gastrointestinal tract and cause intestinal blockage and even death. They can also cause injury if placed in the ear canal or nose.

According to the study, there were an estimated 8,159 visits to U.S. emergency departments from 2007 through 2022 involving water beads among people younger than 20 years. More than half (55%) of cases involved children younger than 5 years. Most emergency department visits in this study involved children swallowing water beads (46%), followed by putting water beads in the ear (33%) or nose (12%). Eye injuries made up 9% of cases in this study.
Most patients were treated and released (92%). The proportion of cases admitted was highest among children younger than 5 years (10%), and this age group accounted for most (90%) of admissions in this study. All admissions among children younger than 5 years involved swallowing water beads.

"The number of pediatric water bead-related emergency department visits is increasing rapidly," said Gary Smith, MD, DrPH, senior author of the study and director of the Center for Injury Research and Policy at Nationwide Children's. "Although swallowing objects and putting them into an ear or the nose are common among children, water beads pose a unique increased risk of harm because of their expanding properties, and they're hard to detect with X-rays."

Water beads in dehydrated form are often sold in sets of tens of thousands, which makes it more likely that misplaced water beads in the home will not be noticed until found by a young child, a group known for exploring their environment by placing objects in their mouth—especially objects like water beads that look like candy.

Water bead toy safety is covered in the ASTM toy safety standard, ASTM F963. The standard addresses bowel obstruction by limiting the size of water beads to the narrowest part of the gastrointestinal tract of a small 18-month-old child.

"The current safety standard is inadequate," said Dr. Smith. "Serious outcomes have occurred to children younger than 18 months, and one-fifth of the water beads swallowed in this study were among children younger than 18 months with the youngest child being 7 months old. Therefore, using intestinal measurements for 18-month-olds is not adequate."

The ASTM F963 toy safety standard also does not address water beads
marketed to individuals 14 years or older as gel blasters or used for home decoration or other purposes.

"Regardless of the intended user or marketing strategy used, a water bead that becomes accessible to a child has the same high-risk characteristics and potential harms. This underscores the need for a more comprehensive regulatory approach," said Dr. Smith. "To be successful, revisions of the ASTM F693 standard and other policy efforts should focus on the primary characteristic of water beads that makes them hazardous, which is their expanding nature."

Legislation introduced in the U.S. Senate (S.4298, Esther's Law) in May 2024 would ban water beads that expand by 50% or more with hydration or expand to a size of 3 millimeters or larger. This legislation followed a similar bill introduced in the U.S. House of Representatives (H.R.6468) in November 2023, titled the "Ban Water Beads Act," and applies to water beads marketed not only as toys, but as educational materials, art materials or art material products, or sensory stimulation materials or sensory tools.

The U.S. Consumer Product Safety Commission is also considering regulation of water bead safety. Major U.S. retailers have stopped selling water bead toys in stores and online.

"Many parents are not aware that water beads can be harmful to children," said Marcel Casavant, MD, co-author of this study and physician at Nationwide Children's Hospital. "If children younger than six years or with developmental delays live in or visit your home, keep water beads out of your home and talk with your childcare directors, preschool teachers, therapists, and others who may be using water beads with young children."

Data for this study were obtained from the National Electronic Injury
Surveillance System (NEISS) database, which is maintained by the U.S. Consumer Product Safety Commission. The NEISS database provides information on consumer product-related and sports- and recreation-related injuries treated in hospital emergency departments across the country.


Provided by Nationwide Children's Hospital


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