

“Orbeez®”: The magic absorbing bead - risk of pediatric bowel obstruction?

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Background	Results	Conclusion
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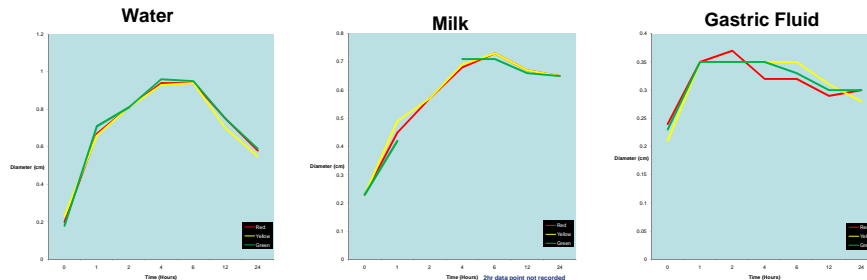
- “WaterBalz®” recalled by Consumer Product Safety Commission in December 2012. Reports of pediatric bowel obstruction¹
- “Orbeez®,” another water-absorbing bead remains available as a children’s toy.
- We sought to determine the extent to which “Orbeez®” enlarge in various liquid media and potential risk for pediatric bowel obstruction.

Methods

- Three “Orbeez®” SuperAbsorbant Polymer (SAP) beads of different colors (red, yellow, green) but of the same material were added to 210ml of the following liquid media:
 - Room Temperature Water
 - Whole Milk
 - Simulated Gastric Fluid (Ricca Chemical Company: 0.2% (w/v) NaCl in 0.7% (v/v) HCl)
 - GoLyte (Braintree Laboratories: PEG 3350 and Electrolytes)
 - Vodka (80 proof)
- Diameter prior to exposure to media were measured using a caliper to the nearest 0.1mm at 1h, 2h, 4h, 6h, 12h and 24h.
- An additional 10 beads were added to simulated gastric fluid and observed for additional 72h (96 h total) for clumping or additional growth.



- Growth was observed in all liquid media
 - The largest growth (11.5mm) was observed in Vodka at 24 hours
 - The least growth (3.7 mm) was observed in simulated gastric fluid
- No clumping was observed at any time
- No bead was greater than 12 mm in size at any time



- “Orbeez®” beads enlarge to a different extent in different liquid media
- Growth in simulated gastric fluid was minimal
- In-vivo growth expected to be less than that of pure water seen in this in-vitro study.

It does not appear that “Orbeez®” swell to sizes that would be concerning for pyloric or intestinal obstruction:

- Normal diameter of pediatric small bowel reported to be 2.5-3 cm¹
 - Pylorus may not permit passage of objects >1.5cm²
- Zamora IJ, Vu LT, Larimer EL, Olutovo OO. Water absorbing balls: a “growing” problem. Pediatrics. 2012 Oct;130(4):e1011-4.
 - NASPGHAN Postgraduate Course Updates on Common Problems and Hot Topics, Oct2011 Kay, M. “Batteries, Magnets, and Lye, Oh My!”: Management of Foreign Body and Caustic Ingestions.

