Interim Bulletin

Button Battery Ingestion

11 October 2018

This interim bulletin contains facts which have been determined up to the time of issue. It is published to inform the NHS and the public of the general circumstances of events and incidents and should be regarded as tentative and subject to alteration and correction if additional evidence becomes available.
Notification of event and decision to investigate

The Healthcare Safety Investigation Branch (HSIB) received a referral regarding a child who died following an unknown and undetected ingestion of a button battery. Her parents reported symptoms of abdominal pain, vomiting and a raised temperature. There were seven contacts in nine days with different healthcare services in the community and hospital, but the battery remained undetected.

Following an initial investigation, the Chief Investigator authorised a full investigation as it met the following criteria:

**Outcome Impact – What impact has a safety issue had, or is having, on people and services across the healthcare system?**

Button battery ingestion in the under 5’s age group can cause death or life-changing injuries. Detectability is difficult when ingestion is unknown partly because of the age of the children, but also due to the variety of non-specific symptoms.

**Systemic Risk - How widespread and how common a safety issue is this across the healthcare system?**

In relation to systemic safety deficiency, button batteries are increasingly being used in household items, many of which have unsecured battery compartments, as referenced by the Child Accident Prevention Trust¹.

The actual incidence in the UK is unknown because data is collected as part of a wider category of foreign object ingestion. Data on button batteries is collected in the USA and over 3,500 incidents of button battery ingestion are reported each year, with numbers steadily increasing.

¹ [https://www.capt.org.uk/button-batteries](https://www.capt.org.uk/button-batteries)
The National Reporting and Learning system (NLRS) was searched for the period 01/05/2008 to 01/05/2018. There were 39 cases of accidental button battery ingestion in children aged 0-7 years in which just over a quarter related to children with mixed symptoms and unknown ingestion.

**Learning Potential – What is the potential for an HSIB investigation to lead to positive changes and improvements to patient safety across the healthcare system?**

Initial information gathered by HSIB suggests that button batteries represent the challenge of paediatric foreign body ingestion, due to both the lack of clear symptoms and the wide variety of outcomes from harmless to death. This is further complicated in cases where the battery ingestion was unnoticed and non-specific symptoms hinder diagnosis, cognisant that severe injuries are found even in cases with early diagnosis.

There are opportunities for HSIB to share learning on a national level to positively influence processes and practices to prevent accidental button battery ingestion in young children, in addition to improving detection when ingested and battery safety.

**History of the event**

The parents of a three-year-old child contacted the NHS111 service in the early hours of a Friday morning, concerned about her health. The father reported that his daughter had pain in her stomach and chest area following an episode of vomiting; she was not eating and was crying frequently in between periods of sleep. She was referred to the GP out of hours service, advice was provided, and the child remained at home.

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2 Leinward et al 2016: Button Battery Ingestion in Children: A Paradigm for Management of Severe Pediatric Foreign Body Ingestions

3 Fuentes et al 2014: Severe esophageal injuries caused by accidental button battery ingestion in children
A further call to NHS111 was made the following day (Saturday morning). The child had similar symptoms with the addition of throat pain and the parents remained concerned. She was again referred to the primary care out of hours service and on this occasion, she was seen by a GP. The consultation took place at a Treatment Centre located at the Emergency Department in a nearby hospital. The GP referred the child to an assessment unit at the same hospital for a review by a paediatrician, where she was diagnosed with tonsillitis. She was prescribed antibiotics, and discharged home.

Five days later, with no improvement in their daughter’s condition and a raised temperature, the family visited their GP. The child was once again referred to the assessment unit at the local hospital; further antibiotics were prescribed by the paediatrician and the family went home.

Three days later, a 999 call was made as the child was reported to be ‘unable to see.’ Following an assessment by the two paramedics who attended, the child remained at home under the care of her parents.

In the early evening of the same day, a second 999 call was made when the child lost consciousness and started to bleed. When the paramedics arrived, she was found to be in cardiac arrest and bleeding heavily from her nose and mouth. Resuscitation attempts continued in the ambulance and on arrival at the local hospital, however sadly the child did not survive.

Five days later, a postmortem examination revealed a 23mm button battery lodged in the child’s oesophagus (feeding tube). The electrical current had eroded the tissue and caused a fistula (abnormal opening) to the aorta.
National context

Previous alert

A Patient Safety Alert was issued by NHS England on 19 December 2014: ‘Risk of death and serious harm from delays in recognising and treating ingestion of button batteries’. The incidents described in the alert related mainly to ensuring an urgent response when a button battery was known to have been swallowed, and the need to consider the possibility of prior button battery ingestion where a child had symptoms such as “haematemesis, haemoptysis and respiratory difficulties. The alert asked NHS providers to:

- identify if delays in recognising and treating ingested button batteries had occurred.
- to consider if local action was required to ensure prompt recognition and treatment.
- to distribute the alert and share any learning.

However, there have been no national publications since focused on the dangers of button batteries.

Lack of data

There is a lack of robust data in the UK indicating the incidence of button battery ingestion and how often this results in harm.

Within the existing literature, there is agreement that the incidence of button battery ingestion and associated morbidity and mortality has increased over the last one to two decades. This is believed to be associated with an increase of the use of button batteries in a range of household products, not just in children’s toys.
Consideration of button battery ingestion in national guidance

National guidance for children presenting with abdominal pain, vomiting, fever, or other non-specific symptoms does not include the consideration of possible prior button battery ingestion.

Identified safety issues

The following safety issues were identified during the HSIB initial review and will form the basis of the ongoing investigation:

- current processes for the identification and treatment of button battery ingestion in children under the age of five years, including management of the associated non-specific symptoms when ingestion is unknown.
- communication and information sharing between NHS111, Primary Care Services, Out of Hours, Acute and Ambulance Services.
- how ambulance services assess and manage paediatric cases in relation to non-specific symptoms.

Next steps

As part of the investigation, HSIB will look in detail at the reference event, applying a human factors-based approach to examine bias in clinical decision making. In addition to this, HSIB will consider other safety initiatives including product safety, design and manufacturing solutions. HSIB are engaging with subject matter experts to guide and advise the investigation team and with key stakeholders including safety and battery industry experts.

The HSIB investigation will continue to explore the identified safety issues and welcomes further information that may be relevant, regardless of source.

The HSIB will report any significant developments as the investigation progresses.