

## HANDLEBAR GRIP RELATED INJURY PREVENTION (GRIP) FEASIBILITY STUDY: ARE EXPOSED METAL HANDLEBAR ENDS ON CHILDREN'S BIKES AND SCOOTERS A RISK FACTOR FOR SERIOUS INJURY?

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**Aim of the Study:** Handlebar-end impact is a well-recognised cause of major abdominal trauma in children. Understanding the risk factors is important, allowing us to guide those responsible for setting safety standards. Ultimately, modifications at the point of manufacture could help reduce the incidence and severity of these injuries.

We prospectively studied the handlebar-end condition on bikes and scooters belonging to injured riders with the specific aim of assessing the feasibility of performing a multi-centre case-control study.

**Methods:** All children attending two UK children's hospitals with any bicycle or scooter injury between March and September 2015 were invited to participate. Mode of injury, injury details, handlebar-end type and handlebar-end condition were recorded.

**Results:** 522 invitations were distributed. Following confirmation of eligibility and attempts to complete missing data, 38 non handlebar-end injuries (Controls) and 12 handlebar-end injuries (Cases) were included. Eight Cases had major abdominal injuries, 3 had minor lacerations and one sustained a shoulder injury.

Exposed metal handlebar ends (figure 1) were more prevalent among Cases than Controls (odds ratio 2.7). The same was true for sub-group analysis of bike-riders only (odds ratio 3.6). However, 8 of 12 Cases sustained injuries despite not having an exposed handlebar end. These data confirm that the multi-centre study will require about 5000 invitations to recruit the required sample size of 454 participants.

**Conclusion:** Handlebar-end impact can cause serious injuries in children. Exposed metal handlebar ends may increase the risk of sustaining serious injuries during falls involving handlebar-end impact. Findings from this feasibility study are essential for proceeding to an appropriately designed and powered multi-centre study providing the necessary data to drive changes in safety standards that will help prevent these injuries or reduce their severity. As serious injuries can occur when grips are intact, other injury prevention solutions should also be developed.

**Figure 1:** Exposed metal handlebar ends

