Upper limb surgery in children with cerebral palsy: the story so far

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BACKGROUND

- Cerebral palsy describes a group of disorders of movement and posture due to a non-progressive lesion in the developing brain[1]. It affects approximately 2 in every 1000 live births[2].
- Impaired hand function affects 83% of children with cerebral palsy[3].
- Upper limb deficits can impact a child's manual abilities, cause pain, impair hygiene maintenance, alter the cosmetic appearance of the limb/s, cause psychological distress, reduce overall independence of the individual and increase carer burden[4].
- Surgical intervention for improvement of upper limb function is reported to be of benefit when careful patient selection is taken into considration[5,6].
- No routinely recognized clinical pathways exist to help determine individuals who would be most suitable for operative management of the upper limb. Additionally, no research exists at present that identifies the characteristics of the patient cohort that are currently being deemed appropriate for surgery.

AIMS & OBJECTIVES

To determine the current trends in selection and assessment of children with cerebral palsy undergoing surgical management of the musculoskeletal deficits of their upper limb at the Royal Children's Hospital.

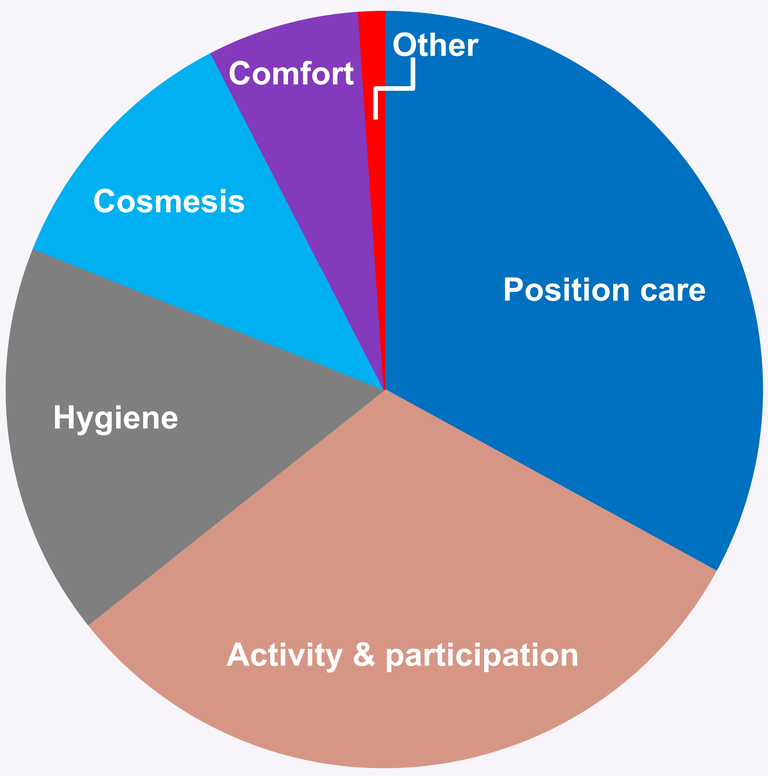
METHODS

Included in this retrospective case series were 102 individuals with cerebral palsy who had undergone surgical management of their upper limb during a 10-year time period at the Royal Children's Hospital. There were 138 separate surgical events involving 591 procedures during this period. Data regarding the characteristics of the patients and details of their perioperative assessment was collected and analysed.

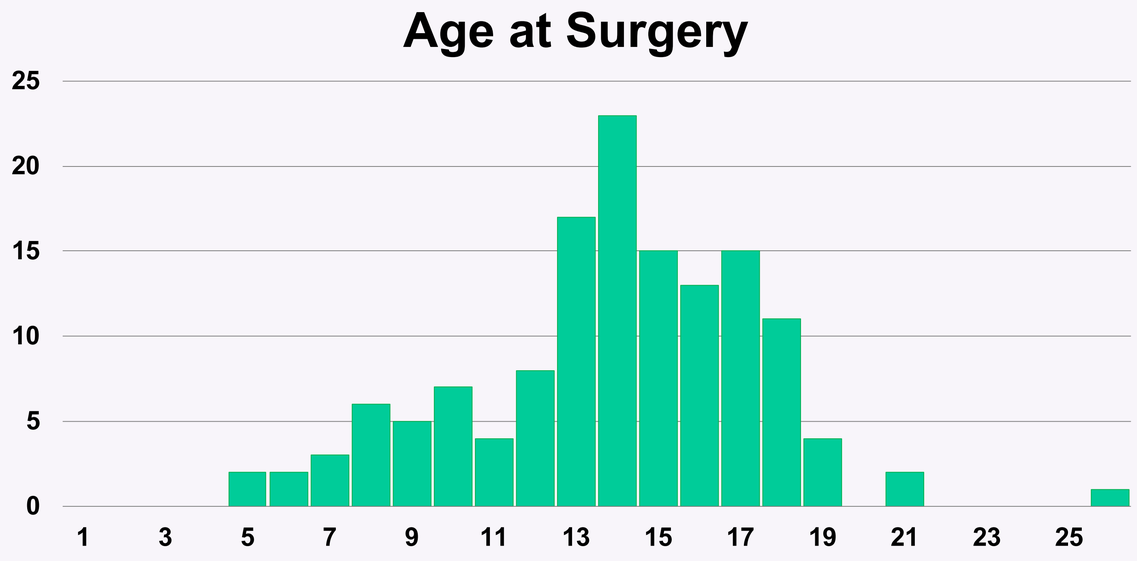
RESULTS

- 56.9% male and 43.1% female, with mean age at time of surgery being 13.9 years old.
- Motor involvement was 51.0% bilateral and 49.0% unilateral
- 96.0% of individuals whose motor type was recorded had a spastic component.
- The most common type of surgical goal was position care (50.4% of cases), followed closely by function and participation (47.9% of cases).
- Sensation was only recorded in eight cases of which all were recorded as affected.
- Cognition was impaired in 60.8%, intact in 20.6% and not recorded in 18.6% of patients.
- The functional ability of participants is charted below as per their recorded Gross Motor Functional Classification System (GMFCS) level/s and Manual Ability Classification System (MACS) level/s. The MACS was not recorded (NR) for 74.5% of individuals. The GMFCS was regularly recorded but quality of recording was variable.
- Preoperative outcome measures were used in 69.6% of cases whereby the most commonly used was range of motion (90.6%). Preoperative assessment was executed in a highly variable manner.
- The right arm was operated on in 47.1% of cases, the left in 39.9% and both in 13.0%.
- The number of procedures per surgery varied from a single transfer to extensive multilevel operations of the upper limb. The mean number of surgical procedures per surgical event was 4.3. The mean number of procedures per patient was 5.8 with a mean of 1.4 surgical events per patient.
- Patient and/or carer satisfaction was not recorded in 68.8% of cases. Of those responses that were recorded, 93.0% were satisfied.

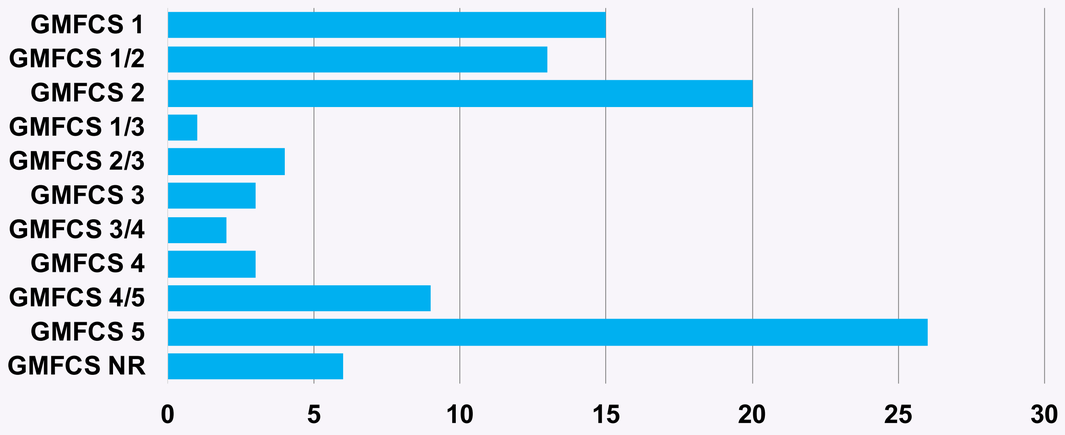
Preoperative Goals of Care



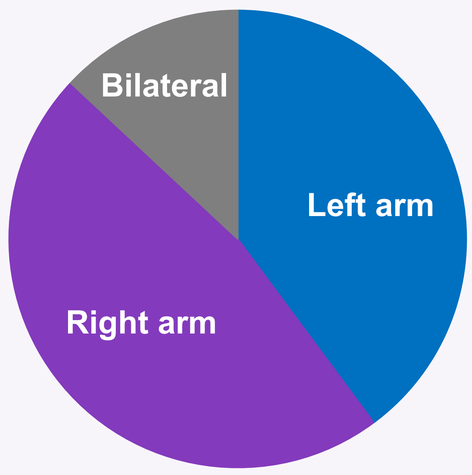
Age at Surgery



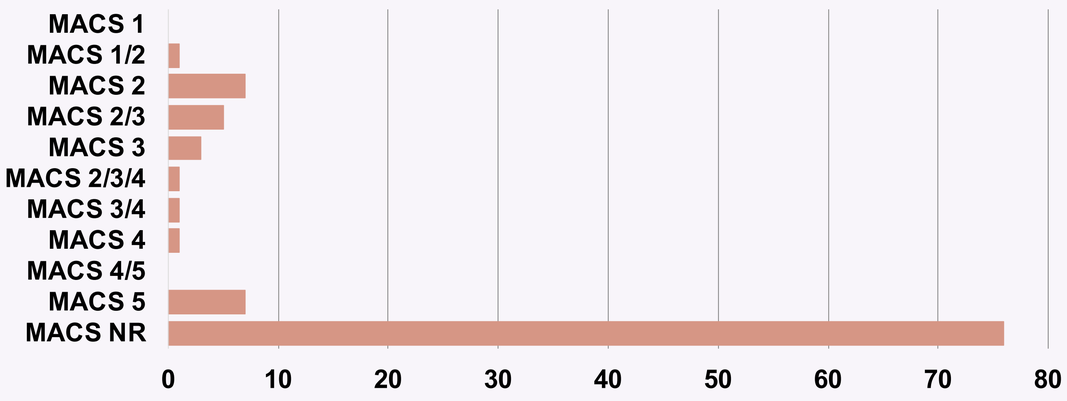
Gross Motor Function Classification System level



Side Operated



Manual Ability Classification System level



CONCLUSIONS

Individuals are selected for surgery using variable preoperative assessment with little to no element of standardisation across individuals. Selection is determined by broadly observed and variable parameters that have great potential to differ between clinicians. These compounding issues provide rationale for initiating further research into understanding the characteristics of this patient group and promoting better standardisation of perioperative assessment. In turn, it is hoped this will result in improved translatability of data to allow better understanding of relevant surgical indicators and their bearing on outcomes.

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