Growth Status of Children Attending the Regional Paediatric Nephrology Service at University Hospital Southampton

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1. INTRODUCTION

CKD is associated with significant morbidity, and mortality. A poor nutritional state can advance progression leading to early dialysis and transplantation which increases the burden of care for all. Growth measures are easy to do and record, and are essential to identify early changes to improve clinical outcome. Unfortunately, these measures are poorly characterised outside those with the most severe disease, despite data being electronically recorded on our hospital systems:

2. Project design and strategy

The project had two aims:
(i) to set up and understand the process and challenges to accessing data electronically to obtain a baseline and annual growth data;
(ii) to produce an initial annual growth report that helps evaluate service provision, monitor response to treatment and improve outcomes.

3. Project design and strategy

The QI group (dietitians, nurses, consultants, IT specialist) used process maps, effect diagrams and problem exploration to identified the challenges faced using electronic information to obtain growth data. PDSA cycles were used to and review the data and trial a model using the following criteria: aged between 0.1 and 18 years; under care of the paediatric nephrology team at Southampton’s children’s hospital; the first measurements of the year. A secure database was developed to obtain: hospital identification number, age, gender, weight (kg), height (cm), BMI (kg/m2), kidney function, date of clinic appointment, and clinic group code (Group 1 General paediatric nephrology (CKD stage 1-3); Group 2 Low clearance clinic, (CKD stage 4-5 pre dialysis, PD and HD); Group 3 Transplant clinic), from the hospital electronic systems. Growth z scores (weight, height and BMI) using the LMS growth package (2), and estimated glomerular filtration rate (eGFR) using the adapted Schwartz formula (3) were then generated. International z score ‘cut off’ values and classifications were also used to help identify under and over - weight or height, low or high BMI.

4. Measures and outcomes

Outcome: Pathway design of process
Growth data report for service development review with team
Process: Identification of nutritional status prevalence across region
Identification of where early intervention is required
Balancing: Increased workload in unfunded areas
Lack of infrastructure to effect improvements

5a. RESULTS

819 children were identified. Over 90% of children had data recorded electronically for anthropometry (92% height, 98% weight and 90% BMI) but only 56% enabled kidney function (eGFR) to be estimated. Figure 1 shows those at greatest risk for poor clinical outcome:
• The worst disease had the lowest measurements
• Transplanted children had a much higher level of obesity and stunting
• Younger children had a lower weight and height sds
• Those with mild disease had obesity levels similar to the general Hampshire population
• Growth changes start early.

Figure 1. Illustrates the between height z score and BMI z score: the bottom 1/3rd represent those most at risk of poor clinical outcome.

Group 1 = General nephrology clinic (CKD stage 1-3); Group 2 = transplant clinic (CKD stage 5); group 3 = low clearance clinic (CKD stage 4-5)

5b. RESULTS

Team members were asked to about the importance of this data and an annual report. The results are shown here in figure 2.

6. Process learning outcomes, challenges and conclusions

• 1st project to use the electronic hospital systems to obtain regional prevalence on height, weight and BMI for children with kidney disease across all stages.
• There were many challenges to obtaining quality meaningful data that took months to overcome.
• A number of key clinical details still need to be accessed electronically to improve interpretation, and evaluate impact of care and clinical outcome.
• An automated report model is also required to improve efficiency.

Conclusions:
• Electronic systems can be used to identify those at risk and target clinical care and improve clinical outcomes.
• Quality improvement methodology enable the process to be approach in a structured systematic way to capture data and highlight challenges.

7. Recommendations for clinical practice

1. Co-morbidities, diagnosis duration, and MDT member need to be electronically accessible.
2. A flagging system needs to be developed to identify those children at risk (this is currently being investigated).
3. A structured approach to care need to be developed within a quality assurance framework to ensure the quality and enable national benchmarking and characterising chronic disease within and across different clinical conditions. Such system exist in other children’s hospitals but not here at Southampton.

REFERENCES