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Are routine pre-operative blood tests required in children undergoing primary cleft lip and/or palate repair?

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Summary Primary surgical repair of cleft lip and/or palate is performed before 9 months of age, often representing the first surgical intervention these children encounter. Obtaining pre-operative blood tests in young children often produces much anxiety for all involved. We reviewed the electronic data of 282 children over a five-year period undergoing primary cleft repairs to determine the value of pre-operative full blood count, and transfusion requirements. Of these, three children required post-operative blood transfusion. In two cases concurrent illness contributed to transfusion requirement. To determine if our findings were consistent with those at other Cleft Centres, the views of primary cleft surgeons in the UK and Ireland were obtained using a questionnaire. A 96% response rate was achieved. The majority of cleft surgeons stated they no longer request routine pre-operative blood tests. Few could recall any of their patients requiring transfusion, and in those that did there was an underlying medical condition contributing to transfusion requirement, and an equal number whom could not have been predicted pre-operatively.

The benefit of obtaining routine full blood count and group and save in children undergoing cleft repair is small in comparison to the stress caused from obtaining these bloods, and has significant cost implications to the Health Service.

It is estimated that approximately 1170 babies are born each year in the United Kingdom with clefts of the lip and/or palate.[1] The primary surgical repair of cleft lip and/or palate is routinely performed before 9 months of age, and often represents the first surgical intervention these children encounter.

Blood transfusion in all patients carries significant risk, and in the UK this is most frequently the result of incompatibility reactions.[2] Whilst blood donors do not receive payment, there are significant costs associated with blood storage and distribution.[3]

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It is well recognised that cross-matching of blood is often performed unnecessarily, often by junior staff uncertain of likely demand, and as a consequence many blood units are cross-matched before surgery that are never transfused and are potentially wasted.[4,5] Approximately 60% of all blood transfusions are given intra-operatively.[5] Group and Save (G&S) determines ABO and rhesus types and screens serum for atypical antibodies directed against red blood cell antigens.[5] Fully crossed-matched blood can be obtained from this G&S within 5—10 min, compared to 45—60 min from a fresh sample. A G&S confers a cost-benefit of approximately £5.21 per patient where transfusion need does not transpire (cost for cross-matching being £10.42, and Group & Save £5.21, based on figures from the Transfusion service at Oxford Radcliffe Hospitals NHS Trust). Where samples are unavailable, uncross-matched ABO rhesus-compatible blood can be given with a 99.9% degree of safety.[6]

Obtaining blood samples from children can be distressing to not only the child, but also their parents, and the medical team. Whilst performed in older children, a study on children undergoing tonsillectomy found that pre-operative haemoglobin, and 'group and save' was not routinely required.[7]

Across the United Kingdom and Ireland there are twelve Regional Cleft Centres. The John Radcliffe Hospital, Oxford is one of two hospitals forming the Spires Cleft centre providing cleft services to the South Central Region. The current practise at our unit is to undertake primary cleft lip (+/− anterior palate) repair at three months of age and posterior palate repair at six months. All children have a pre-operative Full Blood Count (FBC) and Group and Save (G&S).

The aim of this study was to analyse the benefit of pre-operative FBC, and transfusion requirements in children undergoing primary cleft repair, and to determine if these were consistent with those at the other cleft centres throughout the UK and Ireland.

Method

The study was completed in two parts. A list of all children having had either or both primary cleft lip and/or palate repair was obtained from the departmental database, and cross-referenced with theatre lists over the preceding 5 years (2003—2008). During this period 282 primary cleft procedures were performed (42 Cleft Lip repair (CL), 66 Cleft Lip with Anterior Palate (CLAP), 157 Cleft Palate (CP), and 17 Submucous Palate repair (SMCP)). The electronic blood results system (CaseNotes©) was used to obtain the pre-operative FBC results, and determine if a G&S had been performed and blood issued for transfusion. Accuracy of the CaseNote© system was confirmed with the haematology department and blood transfusion service.

In the second part of the study, questionnaires were sent to 27 primary cleft surgeons across the UK and Ireland, to determine current practise and views on pre-operative bloods and transfusion requirements. The details of all primary cleft surgeons were obtained from the cleft co-ordinator at each unit. The questionnaire was distributed via email, and all non-responders followed up by further email, and telephone contact. The response rate was 96%.

Results

Of the 282 children undergoing primary cleft surgery, FBC results were available in 234 (83%). In a further 24 cases the sample was reported as clotted or insufficient. A G&S sample was obtained in 254 patients (90%).

Of the 234 patients in whom a FBC was available, no new pathology was detected. The haemoglobin results are shown in Figure 1. Two children had a haemoglobin below 8 g/dl (7.5 g/dl in both cases), and underwent uneventful cleft palate repair.

In total three children required post-operative blood transfusion (1%). The first case was a three-month-old boy with complete bilateral cleft lip and palate, with no past medical history of note. His pre-operative haemoglobin was 11.3 g/dl. He underwent cleft lip and anterior palate repair which was noted to be uneventful. Post-operatively he had generalised ooze from the wounds. Repeat haemoglobin on the evening of surgery was 7.7 g/dl, and he was subsequently transfused. He was discharged from hospital on post-operative day four.

The second case was a five-month-old boy with isolated cleft lip. He was born prematurely at 29 weeks, had a Patent Ductus Arteriosis (PDA) ligated before cleft repair, and was also noted to have a small Ventricular Septal Defect (VSD). His pre-operative haemoglobin was 11.6 g/dl. Surgery was uneventful. Post-operatively he had a small ooze from the wound which stopped with direct pressure. He was transferred to the Paediatric intensive care unit on the evening of surgery because of stridor and respiratory distress. He subsequently had episodes of melaena, his haemoglobin on post-operative day two was 7 g/dl, and he was transfused. He was discharged from hospital on post-operative day five.

The final case was an 11-month-old boy with isolated cleft palate. He also had been born prematurely at 26 weeks, and in addition to his cleft had hypospadias. An underlying diagnosis of Smith Lemli Opitz syndrome is being investigated. A pre-operative FBC and G&S were not received in the laboratory. His surgery was uneventful. Post-operatively he developed sepsis with vomiting and pyrexia, requiring transfer to the intensive care unit. Haemoglobin on day four post op was 7.6 g/dl and he was transfused by the intensive care team. He made a good recovery and was discharged from hospital on day eight.

Pre-operative investigations in these children did not alert suspicion of a likely need for post-operative transfusion.

	Range	Average	SD
Cleft Lip	8.6 – 12.2	10.6	0.89
Cleft Lip & Anterior Palate	8.5 – 12.9	10.5	0.78
Cleft Palate	7.5 – 14.7	11.3	1.09
Submucous Palate	8.5 – 13.6	11.7	1.44

Figure 1 Haemoglobin results.