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Decrement in haemoglobin predicts length of stay for spondylolisthesis patients undergoing minimally invasive lumbar inter body fusion

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In a retrospective review of 80 minimally invasive (MIS) lumbar fusion patients at an academic tertiary care centre between Jan 2017-Mar 2018, we assessed the contribution of five haemoglobin (Hgb) parameters to length of stay (LOS): preoperative Hgb, postoperative day 1 Hgb, postoperative nadir Hgb, intraoperative Hgb decrement, and total Hgb decrement. Total Hgb decrement had greatest association with LOS and secondary analysis showed correlation with levels fused, supporting our hypothesis and suggesting postoperative occult bleeding as a contributor to LOS. The total haemoglobin decrement from the preoperative level to the postoperative nadir predicts hospital length of stay for minimally invasive lumbar fusion. A retrospective record review of 80 minimally invasive (MIS) lumbar fusion patients at an academic tertiary care institution was conducted between Jan 2017-Mar 2018. Patients undergoing MIS lumbar fusions have variable lengths of stay (LOS). Here we evaluate the predictive value of haemoglobin (Hgb) in determining LOS with a focus on determining whether occult blood loss or haemodilution may account for Hgb decrements during hospitalization. Eighty patients underwent MIS lumbar fusion. We determined 75th, 50th and 25th percentile (quartile) values for patients preoperative Hgb, postoperative day 1 (POD1) Hgb, postoperative nadir (PON) Hgb, intraoperative Hgb decrement and total Hgb decrement. For each quartile, we calculated mean LOS. As secondary analyses, we compared age, # levels fused, American Society of Anaesthesiologists physical status score (ASA-PS) as well as intraoperative, postoperative, and total IV fluids among the quartiles of PON Hgb and total Hgb decrement. Statistical testing for the primary and secondary analyses was performed with one-way ANOVA. Postoperative nadir haemoglobin of less than 10.2 g/dl was associated with a LOS of 83.10 hours. Conversely, postoperative nadir haemoglobin greater than 12.1 g/dl was associated with a significantly shorter LOS of 42.26 hours. ($p=0.0003$) A total haemoglobin decrement of greater than 3.1 g/dl over the hospitalization was associated with a LOS of 87.56 hours. A total Hgb decrement of less than 1.9 g/dl was associated with a significantly shorter LOS of 46.57 hours. ($p<0.0001$) (Figure 1) Patients with a total Hgb decrement of greater than 3.1 g/dl had an average of 3.2 levels operated whereas patients with a total Hgb decrement of less than 1.9 g/dl had 2.5 levels operated. ($p=0.01$) Total haemoglobin decrement over the course of the hospitalization and postoperative haemoglobin nadir predict LOS. Occult blood loss during the postoperative period is likely a contributor to Hgb decrement.

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