EXPECTED UTILITIES OF EPIDURAL OR I.V./I.M. OPIOID ANALGESIA FOR LABOR

Anthony M.-H. Ho, MD, FRCPC, FCCP, Caroline Jenkins, MBBS, Manoj K. Karmakar, MD, FRCA, Gavin M. Joynt, MBBS, FSA, FCCP

Department of Anaesthesia and Intensive Care, The Chinese University of Hong Kong, Prince of Wales Hospital, Shatin, NT, Hong Kong SAR

INTRODUCTION

Epidural analgesia is a highly effective, though “non-essential”, and popular procedure for the parturient. Compared to i.v./i.m. opioid, it provides superior pain relief with less maternal and/or neonatal central nervous system depression. However, it is not without potential side-effects and serious complications. Using decision analysis, we have systematically integrated the benefits and the risks of the two choices of analgesia.

METHODS

We constructed a decision tree as shown. Probabilities of adverse effects (pruritis, maternal fever, shivering, neonatal respiratory depression, permanent neurologic damage, nausea and vomiting, post-dural puncture headache,

Schematic of the decision tree for labor analgesia

failed epidural, high spinal, epidural hematoma and abscess, urinary retention, instrumental vaginal delivery and its attendant maternal and neonatal complications, etc.) were derived from the literature. Utility values were assigned by proxy based on the Health Utility Index 3.¹ To account for permanent neurologic deficit after neuaxial block and hypoxic brain damage due to neonatal respiratory depression, utility reductions were calculated over 70 yrs for mothers and babies. For transient side-effects, utility reductions were based on their average expected durations. Side-effects/complications were not treated as mutually exclusive entities. A Monte Carlo simulation and sensitivity analyses were performed on a simulation cohort of 1 million parturients.

RESULTS

Epidural analgesia enjoys a relatively favorable benefits/risks ratio when expected labor duration exceeds ~3.5 h.

DISCUSSION

It is difficult for any parturient and her anesthesiologist to balance the many potential side-effects of the different labor analgesia modalities against the benefits. Our analysis contains subjective elements, but represents, to our knowledge, the first ever attempt at systematically integrating the important or common risks and benefits. Parturients who are expected to deliver within 3.5 h may not obtain a favorable benefit/risk ratio from an epidural, and should consider using short-acting i.v. opioids or Entonox instead.

REFERENCE

Feeny D, et al. Medical Care 2002;40(2):113-128