The Quality of Neonatal Inter-Facility Transport Systems within the Johannesburg Metropolitan Region

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Declaration

I, Mgcini Desmond Thwala declare that this research report is my own work. It is being submitted for the degree of Master of Medicine in the branch of Paediatrics in the University of Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at this or any other university.

Signed:

On 2nd day of July 2011

Dedication

Praise be to God always!

I dedicate this Thesis to my wife Nompumelelo Thwala for all her support over the years and to my children, Mangaliso, Nonkazimulo and Andiswa for being who they are. Love you always.

And to my mother Mzonono Thwala and my late father Mduduzi Thwala for all your support, thank you.

Abstract

Little is known about the clinical outcomes of neonates who are transported from one health facility to another in resource-poor settings. In resource-rich settings dedicated retrieval teams undertake most, if not all, of the neonatal transfers between different health institutions. Outcomes are often closely monitored and improvements made on a regular basis.

The aim of this study was to ascertain the clinical physiological stability of sick neonates on arrival at the receiving hospital following transport from another health facility, as a measure of the quality of transport facilities available to sick infants within the Johannesburg Metropolitan region.

Infants aged less than 28 days at the time of enrolment and referred to any of the three University of Witwatersrand academic complex paediatric hospitals were studied from October to December 2007. They were transported by either a private or public medical transport unit. Clinical physiological parameters such as oxygen saturation, heart rate, blood pressure, body temperature, blood glucose and muscle tone, amongst others, were documented on arrival of the infant at the receiving hospital, as part of their routine clinical assessment.

A total of 104 retrievals were done during this period of which 96 of them are reported in our audit.

The majority (92%) of the 96 infant retrievals were made by a paramedic-led team. Common adverse clinical events noted on arrival at the receiving hospital included hypotonia (32%), hypoxia (22%), hypothermia (21%) and acidosis (in 21/52 [40%]). The mortality at 48 hours after transfer was 7%. Statistically significant predictors of mortality at 48 hours for transported infants were: bradycardia (OR 38.2, 95% CI 4.4-421, p-value 0.003), hypoxia (OR 29.6, 95% CI 3.31 - 264, p-value < 0.001), hypotension (OR 14.6, 95% CI 1.6 -165, p-value 0.008), poor rating of the transfer process by the receiving clinician (OR 10.59, 95% CI 1.60 - 87.3, p-value 0.006) and hypothermia (OR 6.08, 95% CI 1.01 - 39, p-value 0.03).

The study confirms that many infants arrive in a poor clinical condition following transfer to a referral hospital, with a relatively high mortality in the 48 hours after transfer.

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Abbreviations

AAP	American Academy of Paediatrics
ANNP	Advanced Neonatal Nurse Practitioner
BLS	Basic Life Support
BP	Blood pressure
CATS	Children's Acute Transport Service
CHB	Chris Hani Baragwanath
CPAP	Continuous Positive Airway Pressure
CRIB	Clinical Risk Index for Babies
ECMO	Extracorporeal Membrane Oxygenation
ETT	Endotracheal tube
GEMS	Gauteng Emergency Medical Services
ICU	Intensive Care Unit
IVH	Intraventricular Haemorrhage
KMC	Kangaroo Mother Care
MINT	Mortality Index of Neonatal Transportation
MOU	Midwife Obstetric Unit
NICU	Neonatal Intensive Care Unit
OR	Odds ratio
PHC	Primary Health Care

PICU	Paediatric Intensive Care Unit
PIM	Paediatric Index of Mortality
SA	South Africa
SNAP	Score for Neonatal Physiology
TRIPS	Transport Risk Index of Physiologic Stability
UK	United Kingdom
USA	United States of America
WITS	University of the Witwatersrand