Knowledge, Perception and Practices of Healthcare Professionals at Tertiary Level Hospitals in Kingston, Jamaica, Regarding Neonatal Pain Management

J Young[1], M Barton[1], MA Richards-Dawson[2], H Trotman[1]

ABSTRACT

Objective: *To determine knowledge, perception and practices of healthcare professionals at tertiary level hospitals in Kingston, Jamaica, regarding neonatal pain management.*

Design and Methods: *Physicians and nurses actively involved in providing neonatal care at three tertiary level hospitals were invited to participate. A 21-item self-administered questionnaire was used to obtain information on knowledge, perception and practice of neonatal pain management. Descriptive analyses were performed.*

Results: *A total of 147 healthcare workers participated giving a response rate of 85%. Male to female ratio was 1: 4.4. Nurses accounted for 76 (52%) of the respondents while 70 (48%) were physicians. Seventy-three (50%) individuals were unaware of the degree of pain neonates were capable of experiencing and only 38 (27%) knew that premature infants were capable of feeling pain. One hundred and four (71%) respondents were able to identify physiological markers of pain and most respondents were able to discriminate between painful and non-painful procedures. However, 100 (68%) respondents rarely prescribed analgesia for procedures previously rated as painful. Seventy-one (51%) respondents admitted to not using analgesia for alleviating procedural pain in neonates. Twenty-five (18%) individuals thought that the procedure was too short to require analgesic support while 41 (30%) stated that medication was not usually prescribed for procedural pain. Physician scores were significantly higher than those attained by nurses for knowledge (*$p = 0.003$*) and for pain perception (*$p = 0.001$*) but no significant differences were noted for practice (*$p = 0.18$*).*

Conclusion: *There is an overwhelming deficiency in the knowledge, perception and practice of neonatal pain management at tertiary level institutions in Kingston, Jamaica. There is the urgent need for the education of health professionals on neonatal pain management. This will in turn facilitate change in perception and eventually, along with the institution of local policies and protocols, influence practice.*

Conocimientos, Percepciones y Prácticas de los Profesionales de la Salud en los Hospitales de Nivel Terciario en Kingston, Jamaica, en Relación con el Tratamiento del Dolor Neonatal

J Young[1], M Barton[1], MA Richards-Dawson[2], H Trotman[1]

RESUMEN

Objetivo: *Determinar los conocimientos, percepciones y prácticas de los profesionales de la salud en los hospitales de nivel terciario en Kingston, Jamaica, en relación con el tratamiento del dolor neonatal*

Diseño y métodos: *Los médicos y enfermeras comprometidos activamente en brindar atención neonatal en tres hospitales de nivel terciario, fueron invitados a participar. Se aplicó un cuestionario autoadministrado de 21 incisos a fin de obtener información sobre conocimientos, percepciones y prácticas del tratamiento del dolor neonatal. Se realizaron análisis descriptivos.*

Resultados: *Un total de 147 trabajadores de la salud participaron para una tasa de respuesta de 85%. La proporción de varones frente a hembras fue 1:4.4. Las enfermeras representaron 76 (52%) de los encuestados, mientras que 70 (48%) fueron médicos. Setenta y tres (50%) de los individuos no tenían*

From: [1]Department of Obstetrics, Gynaecology and Child Health, The University of the West Indies, Kingston 7 and [2]Bustamante Hospital for Children, Arthur Wint Drive, Kingston 5, Jamaica, West Indies.

Correspondence: Dr H Trotman, Department of Obstetrics, Gynaecology and Child Health, The University of the West Indies, Kingston 7, Jamaica. Fax: (876) 927-1446, e-mail: helen.trotmanedwards@uwimona.edu.jm.

*noción del grado de dolor que los neonatos podían experimentar y sólo 28 (27%) sabían que los infantes prematuros podían sentir dolor. Ciento cuatro (71%) de los encuestados pudieron identificar los marcadores fisiológicos del dolor y la mayor parte de los encuestados pudieron discriminar entre procedimientos dolorosos y no dolorosos. Sin embargo, 100 (68%) encuestados raras veces prescribieron analgésicos para procedimientos previamente clasificados como dolorosos. Setenta y uno (51%) de los encuestados admitieron no usar analgésicos para aliviar el dolor en los procedimientos con los neonatos. Veinticinco (18%) individuos pensaron que el procedimiento era demasiado breve para requerir apoyo analgésico, en tanto que 41 (30%) plantearon que usualmente no se prescribían medicamentos para el dolor en los procedimientos. Las puntuaciones de los médicos fueron significativamente más altas que las alcanzadas por las enfermeras en relación con los conocimientos (*p = *0.003) y la percepción del dolor (*p = *0.001), pero no se observaron diferencias significativas en relación con la práctica (*p = *0.18).*

Conclusión: *Existe una deficiencia abrumadora en cuanto a conocimientos, percepciones y prácticas en relación con el manejo de los dolores en neonatos en las instituciones de nivel terciario en Kingston, Jamaica. Hay una urgente necesidad de educar a los profesionales de la salud en el tratamiento del dolor en los neonatales. Esto a su vez facilitará un cambio en la percepción, y finalmente – junto con la institución de protocolos y políticas locales – influirá en la práctica.*

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INTRODUCTION

Historically, there has been a reluctance to prescribe appropriate analgesia for newborns and young children (1–3). It was believed that neonates did not feel pain and that if they did, they were unable to recall the experience (1). Furthermore, there was a fear of side effects with the use of conventional drugs (2). Despite the evidence over the last ten years that support nociceptive neurodevelopment in the neonate, the assessment of pain and the administration of appropriate analgesia still lag behind these findings in most settings.

Anecdotally, there is the impression that in Jamaica, neonates undergo minor diagnostic and therapeutic procedures and may even undergo major procedures without analgesic support. We postulate that this practice continues because healthcare workers may be unaware of the fact that neonates feel pain and of the treatment modalities available for relief of this pain. The authors therefore reviewed the current understanding of pain assessment and management and crafted a questionnaire to determine current practice. Evaluation of the knowledge, perception and practice of healthcare workers with regards to neonatal pain management is the first step in determining present barriers that exist to appropriate pain management in neonates.

MATERIALS AND METHOD

Study population

All doctors and nurses who actively participate in the care of neonates in the Anaesthetic Department, Intensive Care Unit, Neonatal Unit and Paediatric Medical and Surgical Departments (where applicable) at the three public hospitals in the Kingston and St Andrew (KSA) region were invited to participate in this study. These hospitals included The University Hospital of the West Indies (UHWI) – a university affiliated institution, The Victoria Jubilee Hospital (VJH) – a specialist Maternity hospital and the Bustamante Hospital for Children (BHC) – a specialist paediatric hospital. These three hospitals serve the population of Kingston and St Andrew, approximately 653 000 people (4). The study was conducted between July to August 2003.

Each individual was invited to complete a self-administered questionnaire consisting of 21 items. Information about demographics, professional level, years of experience and education was obtained in the first section of the questionnaire. The remaining sections of the questionnaire addressed healthcare workers' knowledge, perception and practice with regards to the management of neonatal pain. To ensure confidentiality, self- identification was not required. Scores were assigned using a scoring system designed by the study investigators, with correct answers receiving positive marks and incorrect answers and non-responses zero marks with a maximum possible score of 240. Questions on knowledge, perception and practice were derived from guidelines on neonatal pain management from the American Academy of Paediatrics and the Canadian Paediatric Society (5).

Ethical approval for this study was given by The University of the West Indies/University Hospital of the West Indies (UWI/UHWI), Faculty of Medical Sciences Ethics Committee and the Ethics Committee of the Ministry of Health, Jamaica.

Statistical analysis

Descriptive analyses were performed. Differences in knowledge, perception and practice between various categories of healthcare workers were determined using analyses of variance, Chi-squared test was used for categorical variables and independent *t*-test for continuous variables. Analyses were performed using the Statistical Package for Social Sciences (SPSS) version 11.

RESULTS

One hundred and forty-seven of the 173 questionnaires distributed were returned giving a response rate of 85%. Twenty-seven (18%) of the respondents were males and 120 (82%) were females giving a male to female ratio of 1: 4.4. There were nine (6%) respondents from the Victoria Jubilee Hospital, 28 (19%) from The Bustamante Hospital for Children and 109 (75%) from the University Hospital of the West Indies.

The age distribution of the study population ranged from 21 – 67 years. Most respondents 120 (85%) were between 21 – 40 years. Six individuals did not disclose their ages. Nurses accounted for 76 (52%) of the respondents while 70 (48%) were physicians. Twenty-five (33%) nurses had critical care/anaesthetic training while 50 (66%) did not. One nurse did not state her qualification. Of the physicians, interns accounted for 8 (12%), residents for 45 (64%) and consultants for 17 (24%) of the respondents. One hundred and sixteen (79%) of the respondents had pursued postgraduate training while 31 (21%) had not. Most had completed this training within the five years preceding the study.

Seventy-four (51%) of the respondents were parents while 72 (49%) were not. Forty-eight (33%) individuals admitted to having had a major surgery, 39 (81%) of them thought that they had received adequate analgesia for the procedure. Of the 120 females who participated 54 (45%) had experienced childbirth and 35 (66%) of these felt that they had received adequate analgesia.

Seventy-three (50%) individuals were unaware of the degree of pain neonates were capable of experiencing and only 38 (27%) knew that premature infants were capable of feeling pain (Table 1). One hundred and four (71%) respondents were able to identify physiological markers of pain and most respondents were able to discriminate between painful and non-painful procedures, however 100 (68%) respondents rarely prescribed analgesia for procedures previously rated as painful (Tables 2–4). Seventy-one (51%) respondents admitted to not using analgesia for alleviating procedural pain in neonates. Twenty-five (18%) individuals thought that the procedure was too short to require analgesic support while 41 (30%) stated that medication was not usually prescribed for procedural pain (Table 5).

Although physicians had significantly higher mean scores for knowledge and perception 54 ± 14.1 and 53.0 ± 6.3 when compared to nurses 47.5 ± 19.0 and 47.2 ± 11.9 respectively, $p < 0.01$, there was no significant difference between these groups in the scores obtained for practice (36.3 ± 8.5 and 34.4 ± 8.8 respectively, $p = 0.18$). Within the category of doctors and nurses, there was no difference in overall mean score between those who were five or less years post basic training 142.0 ± 19.9, 136.9 ± 24.0 and those who were greater than five years 144.2 ± 19.1, 127.6 ± 29.4 respectively, $p > 0.05$. There was no difference in the mean overall score between nurses who had critical care and/or anaesthetic training 129.0 ± 30.1 and those who did not receive this specialized training 134.6 ± 22.0, $p = 0.41$. There was no significant difference in overall mean scores between consultants 147.0 ± 19.2, residents 142.9 ± 20.0 and interns 137.1 ± 22.2, $p = 0.48$.

Age, gender, job description, being a parent, having had major surgery or experiencing childbirth did not influence analgesia use for procedural pain in neonates. Healthcare workers who were attached to the neonatal unit were less

Table 1: Assessment of respondents knowledge about the neurophysiology, pharmacotherapy and comfort measures used in neonatal pain

Question	n	Yes (%)	No (%)	DK (%)
Premature infants at 28 weeks can appreciate pain*	140	38 (27)	86 (61)	16 (11)
Neonates feel more pain compared to older children and adults*	145	25 (17)	73 (50)	47 (32)
Development in pain pathways is not complete until 1 year of age*	138	25 (18)	59 (43)	54 (39)
Paracetamol is a useful pain reliever in the neonatal period	143	101 (71)	26 (18)	16 (11)
Ibuprofen is not approved for use in neonates for pain relief*	142	67 (47)	19 (13)	56 (47)
A neonate having moderate to severe pain can receive opioid analgesics*	141	94 (67)	26 (18)	21 (15)
Neonates can easily become addicted to narcotic analgesics	142	27 (19)	65 (46)	50 (35)
Non-nutritive sucking can be used as analgesia in neonates*	143	78 (55)	40 (28)	25 (17)
Sucrose can be used as a form of analgesia in neonates*	142	30 (21)	56 (39)	56 (39)
Swaddling has a role in neonatal pain management*	142	94 (66)	20 (14)	28 (20)
Lignocaine should never be used for pain relief in the neonate	140	33 (24)	61 (44)	46 (33)

DK = don't know, * = True statements

Table 2: Knowledge about markers of pain in the neonate

Question	N	Yes (%)	No (%)	DK (%)
Furrowed brow*	139	119 (85)	8 (6)	12 (9)
Staring gaze	138	58 (42)	45 (33)	35 (25)
Deepened nasolabial folds*	135	66 (49)	23 (17)	46 (34)
Tense cupped tongue*	137	67 (50)	17 (12)	52 (38)
Hand and arm movement*	138	126 (91)	7 (5)	5 (4)
Foot and leg movements*	138	127 (92)	7 (5)	4 (3)
Jerking of the head	130	91 (70)	19 (15)	20 (15)
Increased heart rate*	141	137 (97)	2 (1)	2 (1)
Drooling	137	37 (27)	64 (47)	36 (26)
Increased blood pressure*	140	130 (93)	4 (3)	6 (4)
Sweating*	141	104 (74)	21 (15)	16 (11)

DK = don't know, * = Markers of pain in neonates

Table 3: Perception of degree of pain related to procedure

Procedure	n	Not Painful (%)	Painful (%)	Extremely Painful (%)
Endotracheal intubation	138	16 (12)	89 (64)	33 (24)
Tracheal suctioning	144	20 (14)	94 (65)	30 (21)
Phototherapy*	143	101 (71)	36 (25)	6 (4)
Temperature check*	139	128 (92)	9 (6)	2 (2)
Circumcision	141	2 (1)	29 (21)	110 (78)
Radiograph*	142	130 (92)	10 (7)	2 (1)
Arteriovenous cutdown	143	1 (1)	25 (17)	117 (82)
Lumbar puncture	144	0 (0)	41 (28)	103 (72)
Heel stick	145	0 (0)	73 (50)	72 (50)
Venepuncture	142	0 (0)	53 (37)	89 (63)
Nasogastric tube insertion	142	17 (12)	100 (70)	25 (18)
Chest tube insertion	144	0 (0)	20 (14)	124 (86)

* non-painful procedures

Table 4: Practice of analgesia use in neonates

Procedure	n	Never (%)	Sometimes (%)	Always (%)
Endotracheal intubation	139	112 (81)	17 (12)	10 (7)
Tracheal suctioning	141	122 (87)	16 (11)	3 (2)
Phototherapy*	139	138 (99)	1 (1)	0 (0)
Temperature check*	141	141 (100)	0 (0)	0 (0)
Circumcision	120	18 (15)	27 (22)	75 (63)
Radiograph*	138	133 (96)	5 (4)	0 (0)
Arteriovenous cutdown	124	40 (32)	29 (23)	55 (44)
Lumbar puncture	135	95 (70)	22 (16)	18 (13)
Heel stick	142	131 (92)	5 (4)	6 (4)
Venepuncture	140	120 (86)	14 (10)	6 (4)
Nasogastric tube insertion	141	134 (95)	5 (4)	2 (1)
Chest tube insertion	130	29 (22)	33 (25)	68 (52)

* non-painful procedures

Table 5: Reasons given for non-administration of analgesia

Reason	Frequency (%)
Medication not usually prescribed	41 (30%)
Procedure is short	25 (18%)
Too many side effects	12 (9%)
Unavailability of medications	12 (9%)
Neonates do not feel pain	2 (2%)
Pain has no lasting effects	6 (4%)
Other	11 (8%)

likely to utilize pain relief measures for painful procedures than their counterparts who were attached to other areas.

DISCUSSION

The International Association for the Study of Pain states that pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage or described in terms of such damage (6). It is mediated through specific receptors from tissues and organs that sense noxious stimuli and carry this information to the spinal cord via the peripheral nerves. From the spinal cord, the stimulus travels along designated tracts to the thalamus and the cerebral cortex where its conscious appreciation may be modified by various factors (7). This pain pathway is developed in the fetus during the second trimester and provides the ability for the neonate to experience pain (8). Neonates lack the full development of the pain inhibitory systems and thus may perceive pain more intensely than older children and adults (9). Further development and maturation of this system continues into infancy and childhood.

Neonates undergo a variety of painful procedures in the intensive care setting. These may be diagnostic, therapeutic or surgical. Examples of these include heel lancing, lumbar puncture, arterial and venipuncture, endotracheal intubation, central line insertion, ventricular tap and circumcision (10). Numerous authors have published the recommended drugs and their dosing schedule for the management of pain in neonates. These include opioid analgesics such as morphine and fentanyl as well as both topical and regional analgesia/ anaesthesia (5, 11). Behaviour modification has also been shown to aid in pain management in neonates and includes swaddling, non-nutritive sucking and other comfort measures (2, 3).

Healthcare professionals have long held the belief that neonates are incapable of appreciating pain and that they are less sensitive to noxious stimuli. Studies have indicated a deficit in the knowledge, perception and practice of healthcare workers in the management of neonatal pain (2, 6). These findings are borne out in this study where 71% of the healthcare professionals did not know that premature infants could appreciate pain, 50% did not appreciate the degree of pain felt by neonates, 29% were unable to identify physiological markers of pain in neonates and 51% did not use analgesia to alleviate procedural pain in neonates.

From this study, it is clear that neonatal pain management is suboptimal at tertiary level centres in Kingston, Jamaica. In developed countries neonatal pain management protocols are the norm in most institutions (2, 8). Perhaps our practice is hindered by cultural and social beliefs where one is expected to feel and tolerate pain as a natural part of life experiences. Pain management in neonates has evolved over the last two decades (5, 10); the lack of teaching on neonatal pain and its management in nursing and medical school curricula in Jamaica contributes to the myths and biases that exist and impedes the appropriate assessment and management of pain.

Pain is often inflicted on sick and vulnerable neonates in an effort to preserve or improve their quality of life. It is the responsibility of healthcare professionals to protect neonates from unnecessary pain so that long term effects may be minimized. Individuals who work with neonates must be educated about all aspects of neonatal pain and its management. Policies should be put in place regarding the use of appropriate pain scales in the neonate as well as pain relief

measures. Appropriate analgesics for use in neonates must be added to the hospital drug formularies and there must be incorporation of neonatal pain management modules into the Nursing School and Medical School undergraduate and postgraduate curricula. Appropriate education of healthcare professionals can bring about changes in perception of neonatal pain and improvement in practice.

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