



Profile of In-Patient Paediatric Conditions Managed by Physiotherapists in Aminu Kano Teaching Hospital: A 3-Month Prospective Study

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Abstract

Background: Physiotherapy is a vital component of the multidisciplinary health team for the management of paediatric medical and surgical conditions. **Aim:** The present study evaluates the in-patient paediatric conditions managed by physiotherapists in Aminu Kano Teaching Hospital (AKTH). **Methods:** A total of 32 children were recruited consecutively in this prospective descriptive study and followed up for a period of 3 months. A proforma was used to record socio-demographic and clinical characteristics and the highest functional ability of the study participants. Data was analysed with descriptive statistics and illustrated with tables and charts using SPSS version 20 and Microsoft Excel. **Results:** Majority of the children are boys 19 (59.38%) within the age ranges of 6-10years. Head Injury (HI) accounted for 12(37.5%) of the conditions managed. The commonest cause of HI were road traffic accidents (RTA) 8(25%) and fall from height 4 (12.5%). Ten (71.43%) out of the 14 children with altered level of consciousness had severe HI on admission, however, following a multidisciplinary care, 5 (35.71%) remain with severe HI, 5 improved to moderate HI (35.71%) and 4 improved to mild HI (28.57%). Burns accounted for 12(37.5%) with hot water 7 (21.88%) and flame 5(15.63%) being the commonest cause. At the end of 3 months of in-patient physiotherapy, 13(40.63%) of the patients were able to sit, 9(28.13%) could stand and 5(15.63%) could walk. **Conclusion:** HI and burns are the most common paediatric conditions managed by physiotherapist in the paediatric wards of AKTH. RTA and moist heat are the commonest causes of HI and Burns respectively.

Keywords: *Physiotherapy, In-patients, paediatric, Conditions, Multidisciplinary*

Introduction

The discipline of paediatric physiotherapy is saddled with the responsibility of evaluation, physical diagnosis and treatment of conditions in children, with special focus on improving motor function and promoting independence (Morris, 2008). Physiotherapists manage several childhood conditions in the hospital wards and intensive care unit. They also provide services for paediatric patients with

medical conditions, during post-surgical recovery, as well as disorders around neurological, orthopaedic, cardiopulmonary, soft tissue and cancers in close collaboration with other members of the health team (Peng *et al.*, 2008; Van-Doorn 2010; Gupte & Swaminathan, 2016).

Furthermore, physiotherapists usually collaborate with nurses and physicians in the

management in indolent ulcers, in the administration of ultraviolet radiation before routine wound dressing (Onigbinde *et al.*, 2010). Early physiotherapy intervention has many benefits in children with burns, including the prevention of contractures and limitation in joint mobility that may result from hypertrophic scarring and decreased skin elasticity (Esselman *et al.*, 2006). Physiotherapy intervention improves gross motor performance post head injury, through enhancing muscle strength, balance and mobility skills to facilitate the functioning and integration of the child back to the home, school and community (Haley *et al.*, 1992; Dumas *et al.*, 2004; Galvin *et al.*, 2010).

Respiratory disease is a major cause of acute paediatric hospital admissions with resultant morbidity and mortality (Rudan *et al.*, 2008; Akanbi *et al.*, 2009). Chest physiotherapy is effective in clearing lung secretion (Flenady & Gray 2002) and improving expired tidal volume, respiratory compliance and reduction in both airway resistance (Main *et al.*, 2004) and the risk of pulmonary complications that could result from paediatric cardiac surgery (Felcar *et al.*, 2008). There is increasing demand for orthopaedic physiotherapy to deliver high-quality care to children (Mir *et al.*, 2016) after surgical reduction of fractures (Keppler *et al.*, 2005; Tejwani *et al.*, 2011) and avascular necrosis (Gruson & Kwon 2009).

In Nigeria, a few studies have reported the profile of out-patient paediatric cases managed by physiotherapists. These include cerebral palsy, traumatic and sciatic nerve injury, brachial plexus injury, central nervous system infection, Down's syndrome and facial nerve palsy (Peters *et al.*, 2008; Adelugba *et al.*, 2011; Omole *et al.*, 2013). There appears to be a paucity of published data on the pattern of paediatric in-patient conditions managed by physiotherapists in Nigeria. The study aimed to identify the profile of paediatric conditions managed by physiotherapists in Aminu Kano Teaching Hospital (AKTH).

Methods and Materials

The study population included children who were admitted on the paediatric wards of AKTH and being consecutively referred for physiotherapy during the 3 months of the study (June to August 2018). Physiotherapy interventions for the children, depending on several factors such as the children's level of consciousness, functional ability and clinical presentations may include therapeutic positioning, passive, assisted active and free active exercises, electrotherapy, peripheral joint mobilisation and manipulation, sustained passive stretching of contracted tendons and ligaments, sitting standing and walking re-education, use of orthopaedic appliances like braces and use of walking aids.

Ethical Consideration

Prior to the commencement of the study, ethical approval was sought and obtained from the Ethics Committee of AKTH. Caregivers of the children agreed to participate in the study voluntarily by signing an informed consent form.

Inclusion criteria

The study included all paediatric patients in the inpatient units who were referred to physiotherapy.

Exclusion criteria

All paediatric patients managed in the outpatient unit of the physiotherapy department were excluded. A data capture form was used to collect information on the socio-demographic characteristics of the children and relevant clinical information such as medical diagnosis, cause of the disorder, and physical complications etc. In addition, a simple proforma was used to capture the functional ability of each of the children during the first physiotherapy assessment and this was compared to the functional ability at the end of the study. In addition, for children who had altered consciousness, their level of consciousness was graded with Glasgow coma scale (GCS) on the first day of clinical evaluation and at the end of the study.

Assessment of Functional ability

A patient that can sit without help was scored 2 and a patient that cannot sit or require help was scored 1. A patient that can stand without help was scored 2 and a patient that cannot stand or require help was scored 1. A patient that can walk without help was scored 2, and a patient that cannot walk or require help was scored 1.

Assessment of Level of Consciousness

Level of consciousness was graded with GCS. The GCS is divided into three domains; eye-opening, motor response and verbal response. Eye-opening is scored from 1=No response to 4=Spontaneous. The motor response is scored from 1= No response to 6=Obeys command. A verbal response is scored from 1= No response to 5= Oriented. The highest score in the scale is 15 and the least score is 3. Coma or severe HI was defined as GCS scores ≤ 8 , a score between 9 and 12 is defined as moderate HI and score of 13 to 15 was defined as mild HI.

Data Analysis

The data obtained were analysed using descriptive statistics of frequency and percentages and illustrated using bar charts. Analyses were done using SPSS version 20 and Microsoft Excel.

Results

Physiotherapists managed a total of thirty-two (32) children during this study. About 19 (59.38%) of the children are boys. Majority of them 15(46.88%) were within the age range of 6-10 years. Sixteen (50%) of the children attended primary school and 9(28.1%) never attended school. The characteristics of the children are presented in Table 1.

Table 2 shows the profile of the condition during hospitalisation. Here, head injury and burns had the highest frequency of 37.5% (12) each. In addition, a road traffic accident was found to be the most common cause of paediatric hospital admission 8(25%) and brain tumour 2(6.25%) was the least. Furthermore, 14(43.75%) of the participants function only in recumbent position at the inception of treatment; however, 9 (28.13%) were able to stand at the end of 3 months (Figure 1). Finally, only 14 children had an altered level of consciousness and their GCS was assessed. About 10(71.43%) of them had severe HI at the beginning of the study and only 5(35.71%) remain the same condition at the end of 3 months.

Table 1: Characteristics of the Study Participants (N=32)

Variables	N	%
Age (years)		
1-5	8	25.00
6-10	15	46.88
11-15	9	28.13
Total=32		100%
Sex		
Male	19	59.38
Female	13	40.63
Total=32		100%
Tribe		
Hausa	24	75.00
Yoruba	1	3.13
Fulani	4	12.50
Others*	3	9.38
Total=32		100%
Educational level		
None**	9	28.13
Nursery	6	18.75
Primary	16	50.00
Secondary	1	3.13
Total=32		100%

Key: n=frequency, %=percentage, N=sample size, *others=Marwa and Nupe **4 out of the 9 children not attending school were probably not eligible to enrol because of young age (<4yrs)

Table 2: Clinical Characteristics of the Study Participants (N=32)

Variables	N	%
Diagnosis		
HI	12	37.50
Burns	12	37.50
Leukemia	1	3.13
Sepsis	3	9.38
Cerebral abscess	1	3.13
Hydrocephalus	1	3.13
Cerebropharyngioma	1	3.13
Meningitis	1	3.13
	Total=32	100%
Category of burns		
Burns at upper limb	6	50.00
Burns at lower limb	3	25.00
Burns at hip	2	16.67
Burns at head and neck	1	8.33
	Total=12	100%
Causes of illnesses		
Road traffic accident+	8	25.00
Hot water	7	21.88
Brain tumour	2	6.25
Flame	5	15.63
Fall from a height	4	12.50
Others*	6	18.75
	Total=32	100%
Major physical complications		
Impairment of motor function	22	68.75
Stiffness	5	15.63
Contracture	2	6.25
Severe Spasticity	3	9.38
	Total=32	100%

Key: n=frequency, %=percentage, N=sample size, *DNA mutation, infection, severe malaria, high-grade fever, +motor vehicular accident, hit by a motorcycle

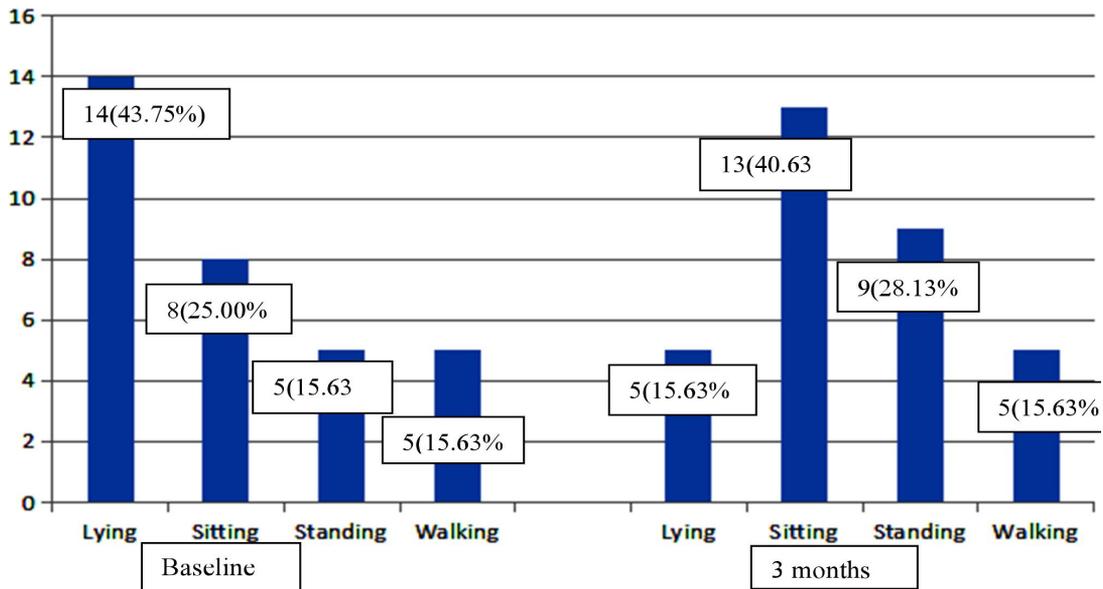


Figure 1: Functional abilities of participants from baseline to the end of 3 months

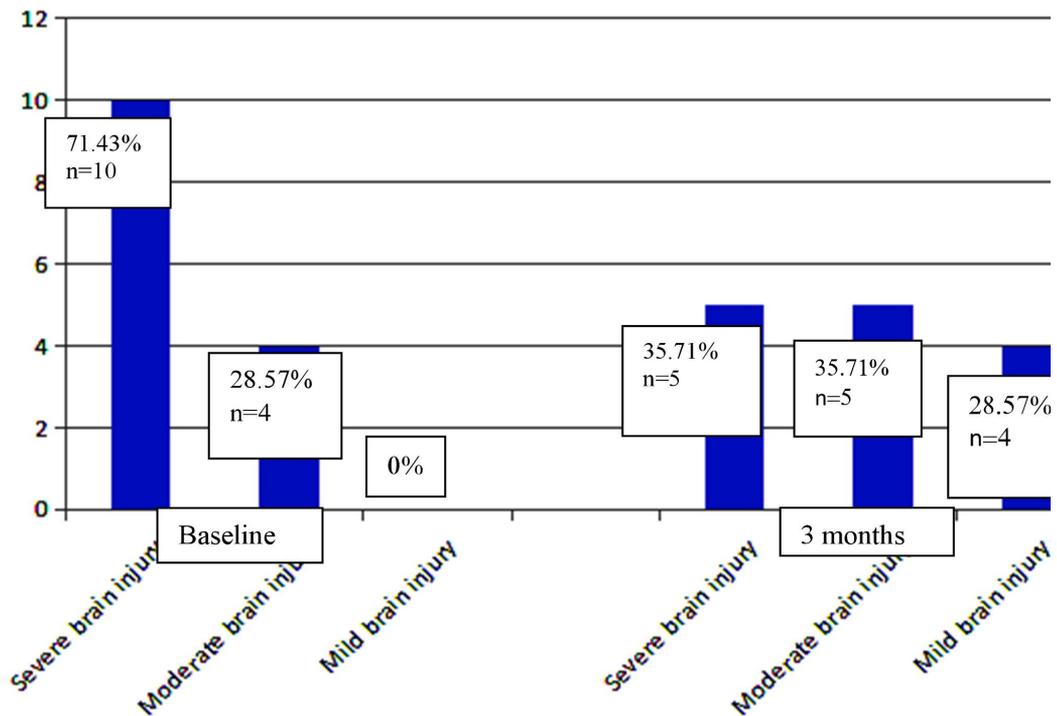


Figure 2: Analysis of the severity of HI from first assessment to the end of 3 months

Discussion

This study was carried out to evaluate the paediatric conditions managed by physiotherapists in the in-patient units of AKTH. The two most common paediatric condition managed by physiotherapists in the in-patient units were HI and burns, with majority of the victims being male children. The possible implication of this finding is that, most of the cases of HI and burns among children may require hospital admission (Trefan *et al*, 2016).

Furthermore, researches have also reported that burns and HI are the commonest causes of morbidity and mortality among young children (Toon *et al*, 2011; Krishnamoorthy *et al*, 2012; Trefan *et al*, 2016).

Findings of this study showed that the incidence of HI is about 37.5%. Past studies have shown that HI is common among children (Chinda *et al*, 2013; Onwuchekwa & Echem, 2018; Dambatta & Sidi, 2019) and especially among male children (Chinda *et al*, 2013; Onwuchekwa & Echem 2018; Dambatta & Sidi, 2019). Furthermore, the commonest cause of HI in this study was road traffic accidents (RTA) which accounted for about 25% of the conditions, followed by fall from height (12.5%). This outcome is similar to other research findings, where RTA (Chinda *et al*, 2013; Udoh & Adeyemo, 2013; Dambatta & Sidi, 2019) and fall from a height (Chinda *et al*, 2013) were the commonest causes of HI among children.

A study reported that social deprivation is the likely cause of the HI among children (Trefan *et al*, 2016). Children are more likely to be exposed to the danger of being knocked down by a moving vehicle or fall from walls or trees when they are allowed to roam or play in the streets without adequate parental guidance (Trefan *et al*, 2016). Furthermore, male children are more likely to sustain HI as observed in this study, probably because, they tend to be more agile and often engage in rough plays than girls and they may prefer to play in the street that exposes them to the

danger of being knocked down by moving vehicles.

Furthermore, this study observed that 10 out of the 14 children who had altered consciousness (71.43%) had severe HI while 4 had moderate HI (28.57%) on admission, however, following a multidisciplinary care, 5 (35.71%) remain with severe HI another 5 improve to moderate HI (35.71%) and 4 improve mild HI (28.57%). A well-coordinated, multidisciplinary and timely care of children who sustained HI will have a positive impact on the prognosis of the condition (Nnadi, *et al*, 2014).

The incidence of burns in this study was 37.5%. Hot water and flame (fire) were also found to be the most frequent causes of burns. Studies have reported that burns resulting from hot liquids are very common among children (Agran *et al*, 2003; Toon *et al*, 2011). We also found that burns affected the upper limbs more than the lower limbs which is in-line with the outcome of a similar that was conducted in Zaria where the incidence of burns affecting upper limb was reported to be high (Abubakar *et al*, 2018). Also in-line with findings of this study, both hot water and flame have been the earlier recorded as common causes of paediatric burns in south-eastern and north-eastern, Nigeria (Jiburum and Olaitan, 2005; Okoro *et al*, 2009; Abubakar *et al*, 2018). Moreover, the flame has been long reported to be most frequent cause of paediatric burns in Zaria (Mabogunje *et al*, 1987).

According to the findings of this study, physiotherapists were involved in the multidisciplinary management of children with leukaemia, sepsis, cerebral access, hydrocephalus, brain tumour and meningitis especially when they presented with the impairment of physical functioning as complications of such conditions. This outcome showed clearly that paediatric cases managed in the inpatient are usually different from those of the outpatient, for example, the outpatient paediatric cases managed by

physiotherapist include, cerebral palsy, traumatic sciatic nerve injury, brachial plexus injury, CNS infection (such as meningitis), facial palsy and down syndrome (Peters *et al.*, 2008; Adelugba *et al.*, 2011; Omole *et al.*, 2013).

In this study, more than two-thirds of the children who were managed by physiotherapists in the wards suffered impairments of motor functions such as loss of selective control of a limb, limb paresis and loss of gross motor function (impairments of sitting, standing or walking functions).

The outcome of this study showed that at the end of three months of inpatient physiotherapy care, the functional abilities of most of the paediatric patients improved from lying to sitting and standing. Well-Coordinated and multidisciplinary care is needed for the improvement of the clinical outcomes of children who are managed in the hospital wards.

This study has some limitations that included the inability to report the degrees of burns because the 'rule of nines' for an adult was erroneously used instead of the age and body surface area-appropriate charts and the result obtained could be misleading. Due to lack of a standardised and validated generic instrument that could evaluate the functional abilities of children who have various disease conditions, functional abilities were assessed simply as the ability to sit, stand or walk for all the study participants.

Conclusion

HI and burns are the most common paediatric conditions managed by physiotherapists in the paediatric wards of Aminu Kano Teaching Hospital. RTA and moist heat were the commonest causes of HI and Burns respectively.

Recommendation

There is a need for more community awareness programs to be organised by all health care professionals on the various ways

parents will prevent their children from sustaining HI and Burns.

Conflict of Interest

Researchers have no conflict of interest to declare.

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