Paediatric surgical research and publications in a developing country setting

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ABSTRACT

Background: Research and publications are important in advancing quality of care as well as improving knowledge. Paediatric surgical research and publications in sub Saharan Africa have not been given much focused attention. **Materials and Methods:** A retrospective review of published work in paediatric surgery from a major paediatric surgical centre in Nigeria from 1969 - 2005. All published work were reviewed for nature of research, organ/system and disease condition studied, nature of publication, volume of publication in relation to staffing as well as journal of publication. **Results:** During the period there were 153 publications consisting of 86 (56.2%) original researches (77 of which were of retrospective study designs and 9 prospective), 56 (36.6%) case reports, 8 (5.2%) letters and 4 (2.6%) review articles. None of the studies and publications was funded. More publications were made when the department of surgery was better staffed. Congenital anomalies (57, 37.3%) and surgical infections (28, 18.3%) were more frequently studied and in 82 (53.4%) publications the gastrointestinal tract was the focus. Most publications were in general medical journals (58, 37.9%) and general paediatric journals (54, 35.3%) but publications in paediatric surgical journals has continued to increase over the years and reached 25.9% by 2005. Some of the difficulties and challenges faced included lack of funding, poor staffing and inadequate facilities for laboratory research. **Conclusion:** Paediatric surgical research and publication in Nigeria is increasing but faces important limitations. Advocacy efforts are needed to improve funding. Networking as well as collaboration is necessary to improve the quality and spectrum of research.

Key words: Advocacy, collaboration, funding, paediatric surgery, publication, research.

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INTRODUCTION

Paediatric surgery as a specialty has gone through decades of challenges and is now a well-established specialty around the world, including Nigeria. In the last 3 decades, advances in technology and refinements in surgical techniques through research has made survival and improved quality of life from severe malformation and diseases possible.[1]

At the Ahmadu Bello University Teaching Hospital, Zaria, Nigeria, paediatric surgery started in 1969[2] and has gone through several developments and reorganization to reach its current state as one of the leading paediatric surgical training and service centres in Nigeria and West Africa. This is a report of the experience with research and publications in paediatric surgery in this centre and is intended to draw attention to the challenges of doing research in this specialty in Nigeria and similar developing country settings. Suggestions are made for improvements, which may be useful to paediatric surgical centres in similar settings.

MATERIALS AND METHODS

Since inception (1969) to December 2005, a total of 153 papers were published on various aspects of paediatric surgery from the Ahmadu Bello University Teaching Hospital, Zaria, Nigeria. These papers have been reviewed; a copy of each paper (or abstract as available) was retrieved and critically reviewed by the same paediatric surgeon (EAA). The last available updated curriculum vitae of staff involved in paediatric surgical care were also obtained from departmental records and information regarding publications and conference abstracts were retrieved.

Information was not available regarding number of journals (and which journal) papers were submitted to before final acceptance.

The years were divided into periods of 1969 - 1978 (1st period), 1979 - 1988 (2nd period), 1989 - 1998 (3rd period) and 1999 - 2005 (4th period) for convenience, as the periods marked times of changing staffing situation in the entire department of surgery. Information was also obtained from departmental records regarding paediatric surgical staffing as well as staffing situation in the department of surgery during each period.

Publications combining a mix of adults and children were excluded as they did not focus exclusively on children and their peculiar problems.

Paediatric surgical care

From 1969 - early 1997, paediatric surgical care in this hospital was provided by paediatric surgeons and to lesser extent general surgeons who were also involved in providing emergency paediatric surgical care. During this period, paediatric surgeons were also involved in providing some adult service. Since April 1997, paediatric surgeons were only involved in providing care for children and adult involvement in paediatric surgical care stopped before the end of that year.

RESULTS

The 153 publications consisted of 86 (56.2%) original articles (retrospective design 77, prospective 9), 56 (36.6%) case reports, 8 (5.2%) letters and 4 (2.6%) review articles. None of the studies were funded by institutions or funding agency.

Volume of publications and staffing [Tables 1 and 2].

More publications were made during the 4th period (6 years) when there were more consultant surgical staff in the department of surgery (1999 - 2005) but the paediatric surgical staffing remained similar during the 1st, 3rd and most of the 4th period. Although the staffing in the department in the 2nd period was similar to the 3rd period, there were more consultant s involved in paediatric surgery in the 2nd period, and more publications were made. However, during the 4th period (1999 - 2005), only paediatric surgeons were involved in providing surgical care for children, compared to other periods when general surgeons were also involved in providing some paediatric surgical care, and paediatic surgeons also provided some adult care. Due, largely to funding limitations, conference abstracts were sparse.

During the 3rd (9, 21%) and 4th (33, 40.7%) periods, trainees became actively involved in writing and publishing [Table 2] and were the lead authors in 7 (22.6%) and 7 (8.6%) of publications during those periods respectively.

Diseases and organs/systems studied [Tables 3 and 4]

Congenital anomalies (57, 37.3%), surgical infections (28, 18.3%) and tumours (23, 15.0%) were the focus of most of the publications. Through all the periods, congenital anomalies were the focus but more attention was given to trauma in more recent times (4th period) [Table 3].

Table 1: Volume of paediatric surgical publication and staffing levels over the 4 periods

Period	Number of paediatric surgical staff	Number of paediatric surgical bedsa	Total number of surgical consultants in department	Publications					Conference abstracts	
				Total (%) (n = 153)	Original researches (No. prospective)	Case reports	Letters	Reviews	International	Local
1st	1	20	6	5 (3.3)	-	5	-	-	-	1
2nd	3	28	7	36 (23.5)	30 (3)	6	-	-	12	4
3rd	[a]1	28	11	31 (20.3)	19 (1)	12	-	-	1	11
4th	[b]4	29	17	81 (52.9)	37 (5)	33	8	4	13	23

Six papers were published after the authors had left the institution. [a]There was only one paediatric surgeons from 1989 - 2003; Up to the end of 1997, some general surgeons were also involved in providing emergency paediatric surgical care, and occasional elective surgery sevice. [b]From January 2004 - April 2005, there were 2 paediatric surgeons and by the end of 2005, there were 4 paediatric surgeons. [c]A dedicated paediatric surgical ward came into use in 1980/81. These do not include beds in the accident and emergency room (this serves both adults and children) and paediatric medical beds (these are only used when the unit is consulted by paediatricians to see a patient on their bed).

Table 2: Authorship of 153 publications during the periods

Period	Number of authors						Trainee involvement	
	1	2	3	4	5	>5	Total number involved as authors	Number of involved as lead authors
1st (n = 5)	1 (20)	2 (40)	1 (20)	1 (20)	-	-		--
2nd (n = 36)	14 (38.9)	6 (16.7)	5 (13.9)	3 (8.3)	4 (11.1)	4 (11.1)		--
3rd (n = 31)	16 (51.6)	3 (9.7)	2 (6.5)	2 (6.5)	5 (16.1)	3 (9.7)	9 (29.0)	7 (22.3)
4th (n = 81)	26 (32.1)	28 (34.6)	15 (18.5)	6 (7.4)	5 (6.2)	1 (1.2)	33 (40.7)	7 (8.6)

Table 3: Nature of diseases studied during the periods

Period	Nature of condition					Total (%)
	Congenital (%)	Infective (%)	Tumors (%)	Trauma (%)	Others (%)	
1st	2 (40)	2 (40)	1 (10)	-	-	5 (3.3)
2nd	20 (57.1)	1 (2.9)	8 (22.9)	1 (2.9)	6 (17.1)	36 (23.5)
3rd	10 (32.3)	5 (16.1)	7 (22.6)	3 (9.7)	6 (19.4)	31 (20.3)
4th	25 (30.9)	20 (24.7)	7 (8.6)	11 (13.6)	18 (22.2)	81 (52.9)
Total (%)	57 (37.3)	28 (18.3)	23 (15.0)	15 (9.8)	30 (19.7)	153 (100)

Table 4: Systems studied during the periods

Period	System								Total (%)
	GIT/ abdomen	CNS/ head and neck	Urogenital	Hepatobiliary	Thoracic	MSS	Combination	Others	
1st	2	1	-	-	-	-	2	-	5 (3.3)
2nd	19	1	7	4	-		5	-	36 (23.5)
3rd	15	6	1	1	3	4	1	-	31 (20.3)
4th	46	12	8	2	3	1	4	5	81 (52.9)
Total (%)	82 (53.4)	20 (13.1)	16 (10.5)	7 (4.6)	6 (3.9)	5 (3.3)	12 (7.8)	5 (3.3)	153 (100)

GIT: Gastrointestinal tract; CNS: Central nervous system; MSS: Musculoskeletal system

In 82 (53.4%) publications, the gastrointestinal system was studied and this system was uniformly given attention throughout all the 4 periods [Table 4].

Journal of publication

Overall, most publications were in regional and international general medical journals (58, 37.9%) and general paediatric journals (54, 35.3%) [Table 5]. However, publications in paediatric surgical journals reached 25.9% during the 4th period. Information regarding how many journals papers were submitted to before final acceptance and publication was not available and acceptance rates could not be ascertained.

DISCUSSION

Research is necessary for advancements in any field and this is more so in the medical sciences. Dedicated work by earlier paediatric surgeons has been responsible for increased understanding and progress in the specialty.[3] Studies of epidemiology, treatments and outcome of specific diseases is important in addressing peculiar local problems. Publication of such researches is necessary for comparison of disease pattern, treatment options as well as outcome of treatments, and providing cost effective care.[4]

In the present report, majority of research and publication (56.2%) were original studies, but ≈90% were retrospective in nature. In one report of paediatric surgical abstracts presented in North America,[5] of 68 clinical papers 25 (37%) were of retrospective analytic designs, 4 prospective and the rest were case series or systematic reviews. Prospective and laboratory and basic science research in our setting is still limited by lack of institutional or industrial funding support. In one report from the United States, basic science research accounted for 25% of studies.[5] However, it must be noted that clinical research is important and rewarding.[6] Case reports still form an important component of publications in this setting, largely because unusual occurrences and cases are frequently encountered and important and practice changing lessons are often learnt in the management of such cases. It is important to note that, because of the nature of the specialty, most paediatric surgical researches are necessarily based on retrospective data or case series.

Volume of publication and staffing

The volume of publication was low in years, when there were few consultants in the department of surgery and paediatric surgeons had to take on adult surgery as Well.[7] It must be acknowledged that several researches, though presented at meetings, never got published and one report[5] from North America noted that only 65% of presented researches got published. This may be attributed to large paediatric surgical workload and few paediatric surgeons. Unlike centres in North America with large paediatric surgical workforce,[8] the active paediatric surgical workforce in Nigeria is still low and their distribution around the country is uneven.[7] At the moment, there are 51 paediatric surgeons in Nigeria (as at November 2007) spread over 18 tertiary hospitals. Furthermore, there are presently 12 residents training in paediatric surgery at the 8 accredited paediatric surgical training centres.

The paediatric surgical training programme in Zaria is now well established, including the training of residents from other institutions; this means that the

Table 5: Journals in which 153 publications were made during the periods (Continued)

Period	General medical (%) n = 58					General paediatric (%) n = 54										
	EAMJ	NPMJ	WAJM	TDC	NMJ	MCOM	NJM	CAJM	MUP	ATP	NJP	CHNS	INPED	JTP	CNPED	ADC
1st	-	-	-	-	2	-	-	-	-	-	-	-	-	-	1	1
2nd	7	-	-	1	1	2	-	-	-	11	3	1	-	1	1	1
3rd	4	-	-	2	-	-	1	2	1	13	-	2	-	1	-	-
4th	12	9	8	5	-	-	1	-	-	16	-	-	2	-	-	-
Total (%)	23	9	8	8	3	2	2	2	1	40	3	3	2	2	2	2

Period	Paediatric surgical (%) n = 25	General surgical (%) n = 13											Others (%) n = 4	Total
	PSI	JPS	EJPS	AJPS	NJSR	IJSS	AJS	ARS	SURG	NJS	CJS	SAJS	BJS	
1st	-	1	-	-	-	-	-	-	-	-	-	-	-	5 (3.3)
2nd	-	2	-	-	-	-	1	1	1	-	1	-	-	1	36 (23.5)
3rd	-	1		-	-	2	-	-	-	1	-	-	1	-	31 (20.3)
4th	14	1	4	2	2	-	-	-	-	-	-	1	-	3	81 (52.9)
Total (%)	14	5	4	2	2	2	1	1	1	1	1	1	1	4	153 (100)

EAMJ: East African Medical Journal; NPMJ: Nigerian Postgraduate Medical Journal; WAJM: West African Journal of Medicine; TDC: Tropical Doctor; NMJ: Nigerian Journal of Medicine; MCOM: Medicom; NJM: Nigerian Journal of Medicine; CAJM: Central African Journal of Medicine; MUP: Medical Update; ATP: Annals of Tropical Paediatrics; NJP: Nigerian Journal of Paediatrics; CHNS: Child's Nervous System; INPED: Indian Paediatrics; JTP: Journal of Tropical Paediatrics; CNPED: Clinical Paediatrics; ADC: archives of Diseases in Childhood; PSI: Paediatric Surgery International; JPS: Journal of Paediatric Surgery; EJPS: European Journal of Paediatric Surgery; AJPS: African Journal of Paediatric Surgery; NJSR: Nigerian Journal of Surgical Research; IJSS: International Journal of Surgical Sciences; AJS: American Journal of Surgery; ARS: Archives of Surgery; SURG: Surgery; NJS: Nigerian Journal of Surgery; CJS: Canadian Journal of Surgery; SAJS: South African Journal of Surgery; BJS: British Journal of Surgery. Others: Journal of urology, urologia internationalis, African Journal of Urology, Burns, African Journal of Trauma, Injury,

few paediatric surgeons also have to make out time for training and there is no definite protected research time at the moment.

Diseases and systems

Majority of the publications focused on congenital malformations and less commonly surgical infections and tumours. However, in later years, increasing attention was given to trauma. This is perhaps, a reflection of the increasing burden of trauma in the setting. Understandably, the gastrointestinal system and abdominal problems were most studied, largely because majority of congenital malformations treated by the paediatric surgeon are in this part of the body. In one report,[5] studies on the gastrointestinal tract accounted for 51.4% of publications.

Journal of ublication

One-third each, of the publications were in general medical and general tropical paediatric journals. The implication of this is that paediatric surgeons as well as other surgeons may not read these journals and the importance of a paediatric surgery paper is easily 'drowned' in the midst of other publications. In general tropical paediatric journals most attention is given to infectious diseases and malnutrition as these are more common problems in developing countries. However, in later years publications in paediatric surgical journals are now being achieved. It is important to note that for purposes of advocacy, relevant papers should still be published in general medical and general paediatric journals to raise awareness to the importance of surgical problems in children. A larger proportion of publications should be in paediatric surgically related journals as well as general surgical journal to avoid isolation.

Problems and challenges

Over the years, some of the problems and challenges encountered in paediatric surgical research and publication in our setting include;

Funding limitations

Little or no funding for research means that most research work had to be funded out of pocket. Studies that are likely to be expensive may be avoided, including laboratory and large scale studies. No research assistants can be hired. This factor has been an important limitation even to the present time.

Staff shortage

Paediatric surgical staffing remained uniformly low in our hospital over the years and this limited the amount of quality time that could be dedicated to research by individual surgeons. There is no protected research time. However, in recent times, general surgical staffing has improved remarkably and that of paediatric surgery has also marginally improved.

Limited research laboratory facilities

Up to the present time, available facilities and reagents for laboratory research are limited and where available are expensive. Even when reagents have to be obtained abroad or samples needed to be sent abroad, it has been problematic.

What solutions?

Advocacy

Advocacy by paediatric surgeons in Nigeria is important. This will help raise awareness to the problems, particularly with regards to public and private sector funding for research.

Improvements in staffing

Although our general surgical staffing situation and to a lesser extent, that of paediatric surgery has improved, there remains a need to expand the staffing. This will help individual paediatric surgeons to focus on various aspects of paediatric surgery as well as specific research interests.

Role of professional associations

At the moment the Association of Paediatric Surgeons of Nigeria (APSON) is being strengthened. It is important that such associations get actively involved in advocacy and canvassing of support for research. They should act as a collective voice for paediatric surgery in the country and this should be more efficient at pressuring government and private sectors and industry to fund and support research. International associations such as European Paediatric Surgeons Association, British Association of Paediatric Surgeons and American paediatric Surgical Association should be helpful in this regard.

Collaboration and networking

Networking is important and helps to increase cases, grants and quality of training,[9] especially for small specialties as paediatric surgery. Internal networking and collaboration should help in developing focused and useful research areas especially for rare conditions. The role of international collaboration cannot be overemphasized, particularly for help with basic science research and relevant research training. International paediatric surgical associations should be helpful in fostering networking and collaboration.

In conclusion, although much has been done, it is now time for paediatric surgery centres in Nigeria to have a definite research orientation. At the moment there is no focused research orientation as noted by one report from India[10] another developing country. Having identified areas of weakness in our research efforts, we should now be in a position to move to address and strengthen these areas.

Worldwide, medical research generally does not generate popular support, particularly with regards to funding problems, training required, lack of support staff as well as ethical issues (especially with respect to animal research). However, the prospects for paediatric surgical research in this setting appears good but important challenges need to be overcome. It is hoped that with increasing staffing and provision of funding, more paediatric surgical research and publication will be achieved in our setting. This should be able to provide appropriate solutions to relevant local paediatric surgical problems.

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REFERENCES

1. Rowe MI, Rowe SA. The last fifty years of neonatal surgical management. Am J Surg 2000;180:345-52.
2. Mabogunje OA. Publications of the department of surgery, Ahmadu Bello University, Zaria, 1967 - 1987. Zaria: Ahmadu Bello University Press; 1987.
3. Cowles RA, Schullinger JN, Berdon WE. Thomas Vincent Santulli: A central figure in the development of paediatric surgery in New York City. Surgery 2006;140:113-7.
4. Hazebroek F. Quality improvement in paediatric surgery: The Rotterdam experience. J Pediatr Surg 2006;41:617-23.
5. Zamakhshary M, Abuznadah W, Zacny J, Giacomantonio M. Research publication in paediatric surgery: A cross-sectional study of papers presented at the Canadian Association of Paediatric Surgeons, and the American Paediatric Surgical Association. J Pediatr 2006;41:1298-301.
6. Gupta D. Research in paediatric surgery: Who should light the flame? J Indian Assoc Pediatr Surg 2006;11:127.
7. Ameh EA, Adejuyigbe O, Nmadu PT. Paediatric surgery in Nigeria. J Pediatr Surg 2006;41:542-6.
8. O'Neill JA, Gautam S, Geiger JD, Ein SH, Holder TM, Bloss RS, *et al*. A longitudinal analysis of paediatric surgeon workforce. Ann Surg 2000;232:442-53.
9. Coran AG, Blackman PM, Sikina C, Harmon CM, Lelli JL Jr, Geiger JD, *et al*. Specialty networking in paediatric surgery: A paradigm for the future of academic surgery. Ann Surg 1999;230:331-7.
10. Prasad GR. Research in paediatric surgery in India: areas of interest. J Indian Assoc Pediatr Surg 2006;11:128.

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