Original Article

Access this article online
Website: www.afrjpaedsurg.org
DOI: 10.4103/0189-6725.143139
Quick Response Code:

Burden of congenital inguinal hernia and hydrocele in northern and southern Nigeria: An opportunity for awareness creation

Musa Ibrahim, Kabiru Ibrahim Getso[1], Mohammad Aminu Mohammad[2]

ABSTRACT

Background: Nigeria, with a population of >150 million people in which half of the population are children encounters challenges in paediatric surgery practice in rural areas. There are paediatric surgeons in Nigeria, but majority practice in tertiary health facilities in cities. The poor rural dwellers have little or no access to such highly trained specialists. Hence, children with congenital and acquired paediatric surgical pathologies including anterior abdominal wall defects not only grow up with these diseases to adulthood, they are also exposed to various health hazards posed by unqualified personnel. Therefore, we are evaluating the burden of congenital inguinal hernia/hydrocele in northern and southern Nigeria for awareness creation and the way forward. **Materials and Methods:** Data obtained from organised free hernia missions to the rural populace from northern and southern Nigeria by the West African Collage of Surgeons in 2010 and Kano State Government in 2013 was analysed. **Results:** A total of 811 patients aged from 3 months (0.25 years) to 35 years was screened and found to have congenital hernia and/or hydrocele from the two centres. 171 (21.1%) were successfully operated, while the remaining 640 (78.9%) could not benefit from a surgical procedure during the missions. There were *n* = 46 (26.9%) patients with various forms of genital mutilations/and or surgical mismanagements among the operated patients. **Conclusion:** The burden of congenital anterior abdominal wall defects among Nigerian children is high. A little effort could bring succor and create awareness among this group of people.

Key words: Burden, hernia/hydrocele, the rural populace, surgical missions

Department of Surgery, Children Surgical Unit, Murtala Mohammad Specialist Hospital, [1]Department of Community Medicine, Aminu Kano Teaching Hospital, [2]Department of Surgery, Aminu Kano Teaching Hospital and Bayero University, Kano, Nigeria

Address for correspondence:
Dr. Musa Ibrahim,
Department of Surgery, Children Surgical Unit, Murtala Mohammad Specialist Hospital, Kano, Nigeria.
E-mail:zarenawa1@yahoo.com

INTRODUCTION

Hernias and hydroceles are common afflictions of mankind associated with morbidity, mortality, physical disability, psychological stress and social isolation, especially among the less privileged individuals living in rural and low-income communities.[1,2] Untreated hernia and hydrocele can not only lead to severe psychosocial embarrassment, but also loss of productivity and fertility.

Though the management of anterior abdominal wall defects including hernia and hydrocele in children is well defined in the literature,[3-9] the burden of such pathology may have dire consequences on countries with poor socio economic status.[10-12]

Several reports have elaborated the need for collaboration between paediatric surgical specialty and societies overwhelmed by growing paediatric population and yet understaffed with qualified paediatric specialists, especially the surgical sub-specialty;[12-16], the high burden of this pathology and need to rescue the growing young populace with anterior abdominal wall defects underscore the importance of conducting this study.

Inadequacy of paediatric surgery services is not only limited to Nigeria, but is also prevalent in most of the African continent.[16-18] There is, therefore, the need to estimate the burden and determine the distribution of congenital hernia and hydrocele which remains largely unknown and/or neglected in rural communities of the most populous African nation-Nigeria.

We are, therefore, presenting our experience from free Hernia and Hydrocele campaigns/missions conducted in southern and northern parts of Nigeria, focusing our attention on congenital sub-types with the aim of improving quality of life of these helpless children with anterior abdominal wall defects.

MATERIALS AND METHODS

Free hernia missions/campaigns conducted and offered to poor rural populace from northern and southern parts of Nigeria in the year 2010 by West African Collage of Surgeons and in the year 2013 by Kano State Government were analysed. The missions/campaigns were conducted at Ogoja General Hospital (OGH), Cross River State in southern Nigeria and Kura General Hospital (KGH) in Kano, northern Nigeria.

Operated patients were followed-up for a week by the visiting-operating paediatric surgeon from the both centres. Contact with the local attending physicians was established via E-mail and cell-phones for regular updates on the postoperative status of the patients. The follow-up period was satisfactory, devoid of major complications.

RESULTS

Cumulatively, 811 patients were screened as having congenital inguinal hernia and hydrocele from the two centres out of which 171 (21.1%) have benefited from the missions (operated). One hundred and eleven of those operated (64.9%) had congenital hydrocele, 41 (23.9%) had hernia, 17 (9.9%) had hernia and hydrocele while 2 (1.2%) had abdomino-scrotal hydrocele.

The nature and sites of congenital inguinal hernia and/or hydrocele are shown in Tables 1a and 1b.

There were 564 patients diagnosed with congenital inguinal hernia and hydrocele from KGH. Ninety-three $n = 93$ (16.5%) patients were operated. Median age of operated patients was 8 years with age range of 0.25 years (3m) to 20 years.

At OGH, 247 patients were seen with congenital inguinal hernia and hydrocele. Seventy-eight $n = 78$ (31.6%) were operated, with median age of 3 years and age range of 0.5 years (6m) to 34 years.

The ratio between those who were screened and those who were operated with congenital inguinal hernia/hydrocele from KGH and OGH was 1:0.16 and 1:0.32 respectively [Chart 1].

Among the operated cases from the two centres, thirteen patients $n = 13$ (17.5%) were said to have been subjected to sclerotherapy at various treatment centres

Table 1a: Nature of lesion operated from KGH

Nature of lesions	*n*	Percentage
Hydrocele	55	59.13
Hernia	27	29.03
Hernia with hydrocele	11	11.82
Total	93	100

KGH: Kura general hospital

Table 1b: Nature of lesion operated at OGH

Nature of lesions	*n*	Percentage
Hydrocele	54	69.23
Hernia	15	19.23
Hernia with hydrocele	7	8.97
Abdomino-scrotal hydrocele	2	2.56
Total	78	100

OGH: Ogoja general hospital

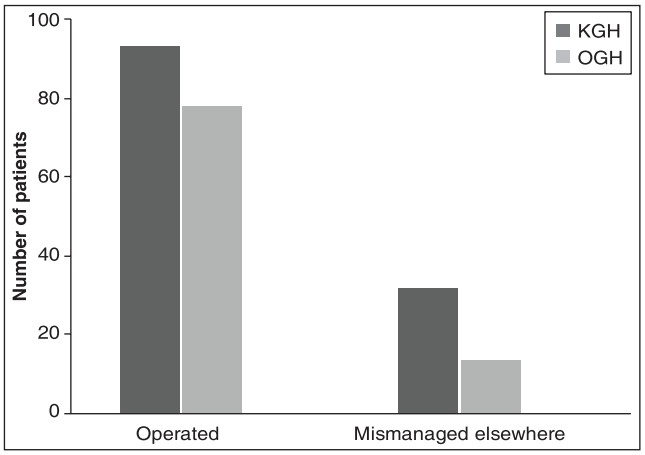


Chart 1: Proportion of patients operated for congenital hernia/hydrocele from the two centers with/without genital mutilation/or surgical mismanagement in rural Nigeria

with poor results. Among those who were operated from the two centres, 46 (26.9%) had various forms of genital/scrotal mutilation by local herbalists/barbers and unqualified health care workers (quacks); while all the 171 (100%) patients operated reported spending their money in search for alternative care elsewhere including traditional healers.

Attempted, unsuccessful conventional herniotomy at various health facilities were seen in 29 patients $n = 29$ (17%) among the operated cases [Figure 1].

Throughout the program, a total of 86 sachets of 4/0 and/or 3/0 Johnson & Johnson Intl Ethicon™ Vicryl® were used. A 45 cm sutures with round body needles were cut into two.

The first half (22.5cm) with its needle was used for a patient and the second half was mounted onto a sterile free surgical needle for subsequent ligation of the



Figure 1: Attempted, unsuccessful conventional herniotomy seen during the mission (missing the hernia sac)

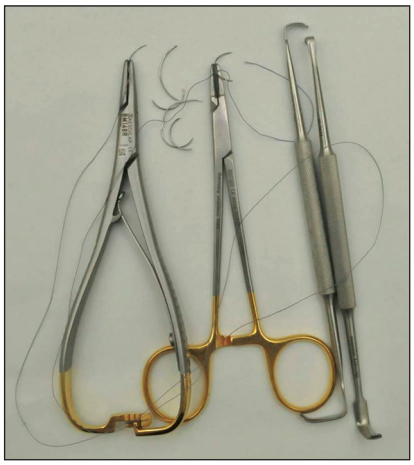


Figure 2: Samples of free surgical needles and suture materials used during the missions. This made it possible for more patients to benefit from the outreach

processus vaginalis and skin closure to ensure cost-effectiveness[Figure 2].

No mortality and no major complications were recorded throughout the missions.

DISCUSSION

Paediatric surgery is a cost effective and essential service for the health of the world's population. Nonetheless, paediatric surgical care in sub-Saharan Africa receives little or no attention both locally and globally.[13,17] Surgical diseases constitute about 11% of the total global burden of disease, of which a substantial fraction unfortunately remains unmet especially in low-income countries.[19,20]

Though numerous reports on burden of surgical diseases in paediatric surgical population in sub-Saharan Africa with a call for global participation abound,[10,13,16,21] there is paucity of data on congenital hernia and hydrocele in African sub-region and the negative consequences such ailment have on paediatric population, which maybe carried into adulthood.

Furthermore, in spite of calls on stakeholders to devote more efforts and resources to strengthen surgical capacity in rural Africa and Nigeria in particular;[22] poor patronage by policy makers and low priority given to surgical diseases by international organisations and donor agencies add to an already existing surgical burden,[11,13,17] anterior abdominal wall defects inclusive.

From our series, a large number of the patients $n = 46$ (26.9%) with inguinal hernia/hydrocele had various forms of genital/scrotal mutilation and or surgical mismanagement by local herbalists/barbers and unqualified healthcare workers. This may not be unconnected with unavailability of specialist surgeons in rural communities; consequently, these people are left with no option rather than to patronise the services of herbalists and unqualified healthcare personnel.

Conventionally, surgical treatment was thought to be expensive, however, data obtained from treating children with congenital groin swellings showed otherwise. According to a report which elaborated on cost-effectiveness of treating congenital inguinal hernia/hydrocele, poverty and ignorance were found to contribute to delaying in accessing such services in some selected cases.[1] In the year 2006, Mhando *et al*.[16] analysed challenges faced in developing paediatric surgery in sub-Saharan Africa and found out that, support for surgical services for children and appropriate delivery of the services were the main issues rather than the cost.

There are also reports indicating delivery of cost effective surgical services to poor rural and urban dwellers and provision of training support to enhance local capacity,[23-30] but none of these efforts is dedicated to anterior abdominal wall defects in children.

Due to limited availability of free surgical missions on the anterior abdominal wall lesions, especially the congenital sub-types and poor participation of local and international experts in these programs, the affected children grow into adulthood with congenital surgical diseases which are associated with social and psychological trauma.

In addition, rural children are more prone to various forms of medical/surgical malpractices due to the fact

that, no surgeon or skilled medical personnel wish to work and/or practice in rural or suburban African environment. In their report, Chirdan *et al*.[13] found out that, out of 86 paediatric surgeons practicing in eight African countries representing 402 million people in which more than half are children, only 7 (8.1%) practice in semi-urban areas, with none practicing in a rural setup.

Compared to Europe and North America, which have two to three paediatric surgeons per million people, Nigeria, the most populous country in Africa has 0.43 paediatric surgeons per million.[14] The deficit in paediatric surgery workforce in Africa and Nigeria compels care-givers to patronise and seek alternatives to surgical care for their wards.

It was demonstrated by this study that, considerable number of children with congenital inguinal hernia/hydrocele in rural/resource-scarce environment are predisposed to various forms of physical abuses and genital mutilations by traditional herbalist/barbers and unqualified healthcare workers resulting to permanent damage in some isolated cases [Figure 3 and Chart 1].

Reports from some authors on paediatric surgical diseases suggest that, congenital hernia and hydrocele constitute a large volume of surgical referrals and in some studies up to 76% of attended cases.[17,31]

Careful patient selection, adequate preparation and proper utilisation of surgical consumables including nonremovable (absorbable) suture materials could impact significantly on the quality of life of these vulnerable children with congenital hernia/hydrocele who are residing in poor rural settings.

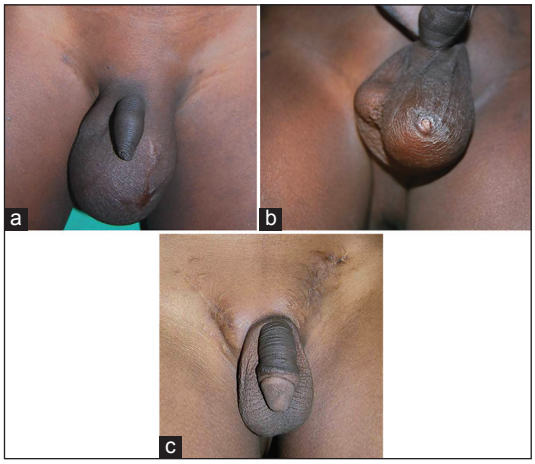


Figure 3: (a) Scrotal laceration in an attempt to repair congenital hernia by traditionalists/herbalists, (b) local barber puncturing the scrotum with a hot metal object in an attempt to drain congenital hydrocele, (c) attempted repair of congenital hydrocele resulting in bilateral testicular atrophy

Large number of paediatric congenital herniae/hydroceles can be repaired when appropriate and enabling surgical camps are established as reported by Blair *et al*.,[32] thereby reducing the chances of such children being mismanaged by unqualified personnel. In addition, this will raise awareness of rural dwellers on surgery and surgery-related diseases.

Reports abound on surgical collaboration with international partners for repair of hernia in adult patients in rural settings, which has proved to be cost-effective with limited complications.[33,34] Hence, this could be applied to growing young population for the purpose of research and to relieve the patients and their parents the burden imposed by congenital hernia and/or hydrocele, especially in resource-limited environments.

In this study, it was evident that, parents and care-givers are always in need and are always constantly seeking for treatment options for their children but for the challenge posed by man-power deficit in rural areas.

Congenital hernia and hydrocele are curable conditions, and the treatment is inexpensive, yet, the burden is high in resource-limited underdeveloped societies occasioned by some of the reasons cited above.

Our observations from free surgical missions showed that hernia and hydrocele are of major concern. Many patients were screened, but only small fraction of those screened could benefit from surgery within a short time frame allotted to the missions [Chart 2].

Initiation and maintaining surgical centres by local authorities in collaboration with international partners in countries with man-power deficits will improve surgical

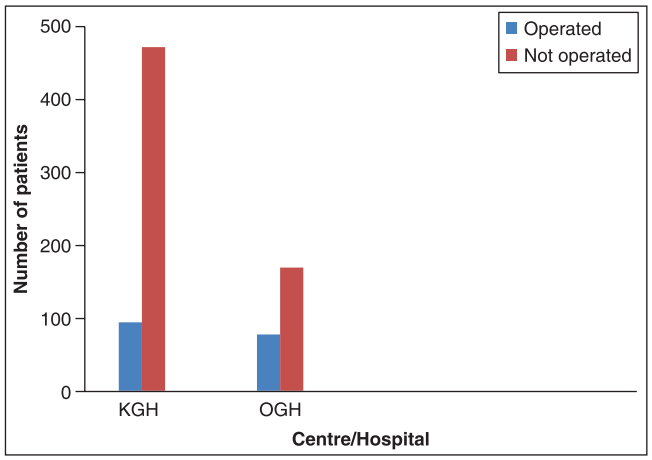


Chart 2: Number of patients screened for congenital hernia/hydrocele during the missions and proportion of operated and not operated from the two centers

service delivery, educate the local populace and rural healthcare providers, provide research opportunities and bring to the fore an understanding of the burden of surgical lesions prevailing in such settings.

Finally, building centres dedicated to hernia/hydrocele surgery as seen in some countries[35] will foster alliance with governments, individuals and donor agencies, create local and global awareness and alleviate the burden of the disease.

CONCLUSION

Skilled and experienced specialist surgeons should reach out to the needy ones residing in rural communities. This will not only decrease the burden of these disease conditions and reduce the chances of rural populace patronising quacks and traditional healers, but will also raise the level of awareness among this group of people. Incorporation of congenital anterior abdominal wall defects for global participation will substantially reduce the disease burden and increase the quality of life of rural dwellers.

REFERENCES

1. Abantanga FA. Groin and scrotal swellings in children aged 5years and below: A review of 535 cases. Pediatr Surg Int 2003;19:446-50.
2. Bijlsma K. Indirect inguinal herina: Towards less invasive surgery in rural conditions. World J Surg 2006;30:1791-2.
3. Banieghbal B. A simplified technique for giant inguinal hernia repair in infants. Pediatr Surg Int 2008;24:737-9.
4. Ho CH, Yang SS, Tsai YC. Minilaparoscopic high-ligation with the processus vaginalis undissected and left *in situ* is a safe, effective, and durable treatment for pediatric hydrocele. Urology 2010;76:134-7.
5. Koski ME, Makari JH, Adams MC, Thomas JC, Clark PE, Pope JC 4th, *et al*. Infant communicating hydroceles — do they need immediate repair or might some clinically resolve? J Pediatr Surg 2010;45:590-3.
6. Lau ST, Lee YH, Caty MG. Current management of hernia sand hydroceles. Semin Pediatr Surg 2007;16:50-7.
7. Seo S, Takahashi T, Marusasa T, Kusafuka J, Koga H, Halibieke A, *et al*. Management of inguinal hernia in children can be enhanced by closer follow-up by consultant pediatric surgeons. Pediatr Surg Int 2012;28:33-6.
8. Uchida H, Kawashima H, Goto C, Sato K, Yoshida M, Takazawa S, *et al*. Inguinal hernia repair in children using single-incision laparoscopic-assisted percutaneous extraperitoneal closure. J Pediatr Surg 2010;45:2386-9.
9. Vaos G, Gardikis S, Kambouri K, Sigalas I, Kourakis G, Petoussis G. Optimal timing for repair of an inguinal hernia in premature infants. Pediatr Surg Int 2010;26:379-85.
10. Ozgediz D, Poenaru D. The burden of pediatric surgical conditions in low and middle income countries: A call to action. J Pediatr Surg 2012;47:2305-11.
11. Ameh E A. Paediatric surgery in sub-Saharan Africa. Pediatr Surg Int 2003;19:128.
12. Ameh E A, Adejuyigbe O, Nmadu PT. Pediatric surgery in Nigeria. J Pediatr Surg 2006;41:542-6.
13. Chirdan LB, Ameh EA, Abantanga F A, Sidler D, Elhalaby EA. Challenges of training and delivery of pediatric surgical services in Africa .J Pediatr Surg 2010;45:610-8.
14. Kushner AL, Groen RS, Kamara TB, Dixon-Cole R, Daoh KS, Kingham TP, *et al*. Assessment of pediatric surgery capacity at government hospitals in Sierra Leone. World J Surg 2012;36:2554-8.
15. Kushner AL, Kallon C, Kamara TB. Free healthcare in SierraLeone: The effect on pediatric surgery .J Pediatr Surg2012;47:628-9.
16. Mhando S, Lyamuya S, Lakhoo K. Challenges in developing paediatric surgery in Sub-Saharan Africa. Pediatr Surg Int 2006;22:425-7.
17. Bickler SW, Kyambi J, Rode H. Pediatric surgery in sub-Saharan Africa. Pediatr Surg Int 2001;17:442-7.
18. Elhalaby EA, Uba FA, Borgstein ES, Rode H, Millar AJ. Training and practice of pediatric surgery in Africa: Past, present, and future. Semin Pediatr Surg 2012;21:103-10.
19. Farmer PE, Kim JY. Surgery and global health: A view from beyond the OR. World J Surg 2008;32:533-6.
20. Jamison DT, Mosley WH. Disease control priorities in developing countries: Health policy responses to epidemiological change. Am J Public Health 1991;81:15-22.
21. Petroze RT, Mody GN, Ntaganda E, Calland JF, Riviello R, Rwamasirabo E, *et al*. Collaboratio nin surgical capacity development: A report of the in augural meeting of the Strengthening Rwanda Surgery initiative. World J Surg 2013;37:1500-5.
22. Henry JA, Windapo O, Kushner AL, Groen RS, Nwomeh BC. A survey of surgical capacity in rural southern Nigeria: Opportunities for change. World J Surg 2012;36:2811-8.
23. Moon W, Perry H, Baek RM. Is international volunteer surgery for cleft lip and cleft palate a cost-effective and justifiable intervention? A case study from East Asia. World J Surg 2012;36:2819-30.
24. Maki J, Qualls M, White B, Kleefield S, Crone R. Health impact assessment and short-term medical missions: A methods study to evaluate quality of care. BMC Health Serv Res 2008;8:121.
25. Laleman G, Kegels G, Marchal B, Vander Roost D, Bogaert I, Van Damme W. The contribution of international health volunteers to the health workforce in sub-Saharan Africa. Hum Resour Health 2007;5:19.
26. Magee WP Jr, VanderBurg R, Hatcher KW. Cleft lip and palate as a cost-effective health care treatment in the developing world. World J Surg 2010;34:420-7.
27. Ruiz-Razura A, Cronin ED, Navarro CE. Creating long-term benefits in cleft lip and palate volunteer rmissions. Plast Reconstr Surg 2000;105:195-201.
28. Chung KC, Kotsis SV. Teaching pediatric hand surgery in Vietnam. Hand (NY) 2007;2:16-24.
29. Poe D. Operation Smile International: Missions of mercy. Plast Surg Nurs 1994;14:225-30.
30. Abenavoli FM. Operation Smile humanitarian missions. Plast Reconstr Surg 2005;115:356-7.
31. Ameh EA, Chirdan LB. Paediatric surgery in the rural setting: Prospect and feasibility. West Afr J Med 2001;20:52-5.
32. Blair GK, Duffy D, Birabwa-Male D, Sekabira J, Reimer E, Koyle M, *et al*. Pediatric surgical camps as one model of global surgical partnership: A way forward. J Pediatr Surg 2014;49:786-90.
33. Shillcutt SD, Clarke MG, Kingsnorth AN. Cost-effectiveness of groin hernia surgery in the Western Region of Ghana. Arch Surg 2010;145:954-61.
34. Kingsnorth AN, Oppong C, Akoh J, Stephenson B, Simmermacher R. Operation hernia to ghana. Hernia 2006;10:376-9.
35. Ozyaylali I, Ersoy E, Yazicioglu D, Ozdogan M, Oruc T, Kulacoglu H. Founding the first hernia center in Turkey. Hernia 2008;12:117-20.

Cite this article as: Ibrahim M, Getso KI, Mohammad MA. Burden of congenital inguinal hernia and hydrocele in northern and southern Nigeria: An opportunity for awareness creation. Afr J Paediatr Surg 2014;11:312-6.

Source of Support: Nil. **Conflict of Interest:** None declared.