

Pattern of cardiothoracic surgical diseases in a new cardiothoracic surgery unit in Nigeria

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ABSTRACT

Background: Cardiothoracic surgical pathologies are available in all geographical regions of the world. Human and material resources are necessary for prompt diagnosis and proper treatment of these cases.

Methodology: Retrospective analysis of cardiothoracic surgical cases in the first five years of our new cardiothoracic surgery unit was done.

Results: A total of 714 cases were seen during the study period with age range one month to 76 years with mean age of 37.12±11.24 and male female ratio of 2:1. The yearly admissions from 2007 to 2011 were 14%, 17%, 21%, 21% and 26% respectively. Cardiovascular diseases occurred in 22.30%, with 6% of children suffering from congenital heart defect and 6% of men suffering from acquired vascular disease. Surgical complications of pleuropulmonary tuberculosis occurred in 21.4% while thoracic trauma occurred in upto 21% of the patients. Aerodigestive tract foreign bodies were encountered in 10.1% of cases and Pyogenic diseases occurred in 8.68%. Oesophageal lesions were diagnosed in 6.4% of the patients, pulmonary tumours including primary and secondary tumours were found in 4.3% while non-traumatic chest wall pathologies which included chest wall tumours, congenital deformities and chronic osteomyelitis accounted for 3.2%. Mediastinal pathologies occurred in 0.98% and in the remaining 1.5% rare diseases were diagnosed such as third degree heart block, pulmonary embolism and thoracic endometriosis syndrome.

Conclusion: This study shows that cardiothoracic surgical pathologies are common in our centre with predominance of thoracic pathologies, and therefore need to prioritize and ensure manpower development for treatment of all kinds of thoracic pathologies.



INTRODUCTION

Cardiothoracic surgery is the field of medicine involved in surgical treatment of diseases affecting organs inside the thorax; generally surgical treatment of conditions of the heart and lungs. This is highly specialised area of surgery and in Nigeria, it is only available in some tertiary health institutions including medical schools. This implies that when a patient is diagnosed as having cardiothoracic surgical problem where the service is not offered, the patient will need to be referred to a

centre where this specialty is available. This was the situation in our hospital which did not have cardiothoracic surgery unit until 2007. The limited availability of cardiothoracic surgery unit in medical schools in Nigeria also affects the evaluation, diagnosis and treatment of patients with cardiothoracic diseases if the attending doctor did not have the opportunity of being taught cardiothoracic surgery at both undergraduate and postgraduate levels. Every effort should be made to establish cardiothoracic surgery unit in all medical schools in Nigeria since cardiothoracic surgery diseases are present in all parts of the country as have been reported by various authors.(1-8)

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Since our cardiothoracic surgery unit is new in the hospital and state, we set out to analyse the pattern of diseases in the unit with a view to prioritizing resources and manpower development, and public enlightenment.

Materials and Method:

This is a retrospective study which involved analysis of case notes of all the patients seen in the unit from January 2007 to December 2011. Information on demography, clinical features, investigations, diagnosis, treatment / plan and outcome were entered into a proforma. Data analysis was done by simple proportions / percentages.

RESULTS

Analysis of yearly admission shows that there was gradual yearly increase in the number of patients from 2007 (with about 14% in 2007, 17% in 2008, 21% in 2009) to 2010 which witnessed a strike action in the hospital. Following that year with about 21% of the total patient population, 2011 recorded about 26% of patients of the total 714 patients admitted in the unit during the period under review (table 1).

As seen in table 2, the male to female ratio is 2:1, the age ranges from less than one month to 76 years with mean age of 37.12 ± 11.24 .

Table 3 shows the various cardiothoracic surgery diseases recorded during the study period. Cardiovascular diseases were diagnosed in 22.30% of patients which included 9.66% of men (where vascular diseases accounted for 6%); 4.60% of women (with vascular diseases occurring in upto 2%) and 7.98% of children (where congenital heart defects occurred in about 6%). Acquired heart diseases occurred in 3.36% while pericardial diseases occurred in 1.96%. Surgical complications of pleuropulmonary tuberculosis occurred in 21.4% of the patients studied. These included 11.76 in men, 4.76 in women and 4.48 in children. Of these, pleural effusion accounted for about 14%, spontaneous pneumothorax in 2.5%, emphysematous bulla in 0.98%, and 0.56% each for lung abscess, haemoptysis, fibrothorax and destroyed lung syndrome. Thoracic trauma occurred in upto 21% of patients distributed as blunt chest trauma in

about 65% and penetrating in the remaining 35%. The various pathological entities of thoracic trauma encountered included rib fractures, haemothorax, pneumothorax, haemopneumothorax, lung contusion and haemopericardium.

Aerodigestive tract foreign bodies were encountered in 10.1% of the patients and these foreign bodies were distributed as about 60% in the oesophagus and 40% in the airway. More than 60% of the aerodigestive tract foreign bodies occurred in children. Pyogenic diseases occurred in 8.68% of the patients and these included empyema thoracis (7.4%), lung abscess (0.98%), and bronchiectasis (0.28%). Oesophageal lesions were diagnosed in 6.4% of the patients where accidental corrosive ingestion in children occurred in 17 of the 25 (68%) patients who drank caustic substance. Pulmonary tumours including primary and secondary tumours were found in 4.3% while non-traumatic chest wall pathologies which included chest wall tumours, congenital deformities and chronic osteomyelitis accounted for 3.2%. Mediastinal pathologies occurred in 0.98% and included mediastinal tumour and retrosternal goitre.

In the remaining 1.5% rare diseases were diagnosed and these included third degree heart block in two patients, pulmonary embolism in two patients, thoracic endometriosis syndrome in four patients

Tables of results:

Table 1: Yearly admission of cardiothoracic pathologies from 2007 – 2011

Year	Sex			Total
	Men	Women	Children	
2007	48 (6.7)	21 (2.9)	32 (4.48)	101 (14.1)
2008	67 (9.38)	27 (3.78)	33 (4.6)	127(17.78)
2009	81 (11.3)	30 (4.2)	39 (5.46)	150(21.0)
2010	83 (11.6)	27 (3.78)	37 (5.18)	147(20.58)
2011	102(14.28)	48 (6.7)	39 (5.46)	189(26.47)
Total	381(53.3)	153 (21.4)	180 (25.2)	714(100)

Table 2: Age/sex distribution of cardiothoracic surgery admission from 2007 to 2011

Age	Sex		
	Male (%)	Female (%)	Total (%)
< 1 month	28(3.9)	14(1.96)	42(5.88)
1 – 12 months	21(2.9)	17(2.38)	38(5.3)
1 -10 years	42(5.88)	25(3.5)	67(9.38)
11 – 20 years	29(4.0)	14(1.96)	43(6.0)
21 – 30 years	64(8.96)	18(2.5)	82(11.48)
31 – 40 years	91(12.7)	31(4.3)	122(17.0)
41 – 50 years	98(13.7)	36(5.0)	134(18.76)
51 – 60 years	59(8.26)	39(5.46)	98(13.7)
61 – 70 years	40(5.6)	16(2.2)	56(7.8)
> 70 years	22(3.0)	10(1.4)	32(4.48)
Total	494 (69.18)	220(30.81)	714(100)

Table 2. Gender and Subjects' Characteristics

Pathology	Sex			
	Men	Women	Children	Total
Cardiovascular				
Cong heart defects	2(0.28)	1(0.1)	46(6.4)	49(6.86)
Acquired heart dx	17(2.38)	7(0.98)	-	24(3.36)
Pericardial disease	7(0.98)	5(0.7)	2(0.28)	14(1.96)
Vascular	43(6.0)	20(2.8)	9(1.26)	72(10.08)
Total	69(9.66)	33(4.6)	57(7.98)	159(22.3)
Thoracic trauma				
Blunt chest trauma	75(10.5)	20(2.8)	4(0.56)	99(13.86)
Penetrating trauma	40(5.6)	11(1.5)	-	51(7.1)
Total	115(16.1)	31(4.3)	4(0.56)	150(21.0)
Pyogenic diseases				
Empyema thoracis	34(4.76)	11(1.5)	8(1.1)	53(7.4)
Lung abscess	4(0.56)	3(0.4)	-	7(0.98)
Bronchiectasis	2(0.28)	-	-	2(0.28)
Total	40(5.6)	14(1.96)	8(1.1)	62(8.68)
Pulmonary tumours				
Primary lung tumours	11(1.5)	7(0.98)	-	18(2.5)
Metastases	6(0.8)	7(0.98)	-	13(1.8)
Total	17(2.38)	14(1.96)	-	31(4.3)
Complications of PPTB				
Pleural effusion	51(7.1)	26(3.6)	28(3.9)	105(14.7)
Emphysematous bulla	5(0.7)	1(0.1)	1(0.1)	7(0.98)

DISCUSSION:

As would be expected of a new service unit in the hospital, yearly admission of patients in the unit gradually increased during the study period up until 2010 when there was stagnation because of a strike action in hospitals in Nigeria including our hospital. What this shows is that there are many patients with cardiothoracic surgery diseases and with the awareness on the existence of the unit, patients were referred for treatment. The male preponderance found in this study has been corroborated in other related studies.(1,2) This is partly because of the more risky behaviours of males than females from childhood to elderly age group in terms of occupation, travel, crime and social habit which make them more predisposed to diseases and trauma.(1)

This study has shown a wide variety of pathologies presented to the new cardiothoracic surgery unit typifying the general pattern in Nigeria which has been discovered in the study by Adebajo et al in 1979.(1) This study shows affectation of patients from neonates to elderly which has also been shown in other studies.(1,2,6,7) Out of a total of 183 children documented in the study, 135 (>73%) presented because of congenital heart defect, pleural effusion, corrosive ingestion, and aerodigestive tract foreign body. This is expected because congenital conditions are understandably more common in children, the same age group where bronchopneumonia leading to pleural effusion is also common so also ignorance and accidental ingestion of caustic substance or ingestion or inhalation of foreign body.(8-13) Adult age group significantly suffered from thoracic trauma than children and elderly people. This same finding has been corroborated by other authors and is explained by the fact that the adult age group particularly males are more involved in behaviours known to be associated with high risk such as occupation, sport, crime and travel.(1,6,7,14,15) Elderly people constituted a greater proportion of the vascular cases diagnosed in this series which included peripheral arterial occlusion, thoracic and abdominal aortic aneurysm and peripheral artery aneurysm. These same findings were made by Nwafor et al.(16)

Cardiovascular diseases constituted 22.2% of all cardiothoracic surgery diseases in this study. This is significant and begs for resources and manpower in

the care of such patients. However since the total care of these patients is a major endeavour it is recommended that facilities and manpower should be fully developed for diagnosis and treatment of some of the cardiovascular diseases. Congenital heart defects which demand open heart surgery and thoracic aortic aneurysms which need cardiopulmonary bypass for their treatment should be concentrated in the National Cardiothoracic Centre of Excellence which has been established in the country and dedicated for such treatment.(2) These patients were appropriately referred to other hospitals for treatment since even the National Cardiothoracic Centre of Excellence still refers some of their cases.(16) Treatment of other types of cardiovascular diseases encountered in this study has been undertaken in the unit with good results as previously reported. Thoracic trauma was found to account for 21% of pathologies in this study, distributed as 65% of blunt and 35% of penetrating injuries. Rib fractures were common and were treated with intercostals nerve block and systemic analgesic along with chest physiotherapy. Chest injuries associated with pleural fluid collection were successfully treated with closed tube thoracostomy drainage in almost all cases with only few patients requiring thoracotomy. These modes of treatment have been found successful by other studies.(6,7,14,15) Pyogenic diseases dominated by empyema thoracis accounted for 8.68% of all cases in this study.

This is high and further portrays the poor standard of living in the country where poverty, ignorance and illiteracy level is high. These have been found in previous study to be correlated with progression of bronchopneumonia to empyema thoracis.(12) Again most of the cases of empyema thoracis in this study were in acute and subacute phases and therefore completely treatable with appropriate antibiotic and pleural drainage with recourse to thoracotomy and decortications in few cases only; same pattern found in other related studies.(10,12,17,18) The other forms of pyogenic disease which included lung abscess and bronchiectasis were treated non-operatively as an acceptable option. Indications of surgery in patients with pleuropulmonary tuberculosis formed 21.4% of patients in this study amongst which pleural effusion accounted for about 68%. This also shows suboptimal healthcare in the country where tuberculosis is diagnosed late and compliance with treatment is poor as previously documented.(1) Other disease entities in

this group included emphysematous bulla, haemoptysis, destroyed lung syndrome, spontaneous pneumothorax, lung abscess and fibrothorax. These entities have been recognized in the country for more than 30 decades now,(1) which raises the query on the purported improvement in the country's healthcare services. In addition to anti-tuberculous drugs, the patients with emphysematous bulla were treated with Monaldi tube decompression while those with spontaneous pneumothorax were treated with closed thoracostomy tube drainage. Again the surgical complications of pleuropulmonary tuberculosis were commoner in men than women because of the peculiar social habits of men which have been associated with development of infectious diseases.(19)

Oesophageal lesions were found in 6.4% of patients in this study, and included corrosive ingestion, oesophageal atresia, achalasia cardia, and oesophageal tumours. Corrosive ingestion occurred in 25 patients out of which 17 (68%) were children and all accidental. Half of the paediatric cases of corrosive ingestion did result into oesophageal stricture, all of whom have achieved adequate oesophageal function following successful oesophageal replacement operation using colonic conduit (three patients), oesophageal dilatation (two patients), and two referred for treatment elsewhere.(13) The cases of oesophageal atresia operated on in this study all had staged procedure with initial cervical oesophagostomy, lower oesophageal banding and feeding gastrostomy for later oesophageal replacement operation. All cases of achalasia cardia in this study had successful transthoracic modified Heller's operation. The same approach to treatment had been found successful in the study by Anyanwu et al.(20) Presentation of patients with oesophageal tumour in this study was commonly late thereby making most patients unsuitable for oesophagectomy and oesophageal replacement. Therefore most patients in the series had palliative procedure for enteral feeding while only very few could be treated by oesophagectomy and oesophageal replacement. One female patient with advanced oesophageal carcinoma was treated with oesophageal bypass operation using colonic conduit in the presternal route. This same trend has been observed in the country for many decades.(1)

Aerodigestive tract foreign bodies constituted 10.1% of patients in this study. In our hospital, this treatment is

undertaken by the cardiothoracic surgery unit and otorhinolaryngology unit. Again being commonly act of accident, children constituted more than 61% of cases of aerodigestive foreign bodies. Instrumentation (brochoscopy or oesophagoscopy) and removal were successful in almost all cases with only very few patients requiring brochotomy or oesophagotomy for removal of foreign body. In the study by Ozguner et al no patient with aerodigestive tract foreign body required operation for removal instead oesophageal foreign bodies that could not be extracted were pushed into the stomach. (9)

Chest wall pathology accounted for 3.2% of cases in this study. The entities encountered included chest wall deformity, chronic osteomyelitis of rib or sternum, and chest wall tumours. Both soft tissue and bony chest wall tumours have been treated with chest wall reconstruction in the unit with some previous reports. (21) A major impediment towards management of chest wall pathology is unavailability of methyl methacrylate mesh sandwich for rigid chest wall reconstruction when chest wall tumorectomy would result in a wide bony chest wall defect.

This study shows some increase in the cases of pulmonary tumours over previous studies by other authors. (1,22,23) This may be due to more availability of computed tomographic scan and diagnostic bronchoscopy. Primary bronchogenic carcinoma were more common in men while secondary lung tumours were commoner in women. This same pattern has been found in other related studies. (1,22,23) In all, pulmonary tumours were diagnosed in 4.3% of patients in the study with all presenting in advanced stage which precluded resectional treatment. A common reason for late presentation is previous misdiagnosis of such patients as pulmonary tuberculosis and inappropriate treatment with antituberculous drugs. (1)

Other pathologies in this series included pericarditis and heart block. These entities have been diagnosed and treated in the country as shown in previous studies. (24,25,26) The two patients with complete heart block were referred to other centres for artificial cardiac pacemaker insertion, while the patients with pericarditis were successfully treated.

CONCLUSION

There is predominance of thoracic surgical pathologies in this study accounting for a total 77.7% of the patients. Since only 22.3% were accounted for by cardiovascular diseases, resources and manpower development should be prioritized for full diagnosis and treatment of most kinds of thoracic pathologies while complex cardiovascular diseases can be referred to more advanced centres for treatment.

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