cosmetic results. Other advantages were less post-operative blood loss, shorter postoperative hospital stay and early return to pre-operative status than similar conventional surgery.

Cremer et al shows the same results[10]. Mulder and Vanermen pointed out that patient with an antero-lateral thoracotomy for atrial septal defect closure has less pericardial adhesions, which is advanta-geous in case secondary operations for acquired heart diseases are necessary[5].

Cost effectiveness was found less in anterolateral thoracotomy approach due to less ventilation time, less ICU stay, less hospital stay, less use of blood during and after procedure and early discharge from hospital. When assessing overall cost, a faster return to normal activity also has to be considered.

In our social and religious custom the atrial septal defect repair through right anterolateral thoracotomy is very much acceptable procedure than that of conventional median sternotomy.

Asit Baran Adhikary[1], Sarwar Kamal[2], Sanjoy Kumar Saha[3], Aslam Hossain[1], Sayed Abdul Quader[2], Badruzzaman[2] and Prasanta Kumar Chanda[4]

[1]Department of Cardiothoracic Surgery, Bangabandhu Sheikh Mujib Medical University, Shahbag, Dhaka; [2]Department of Cardiovascular Surgery, National Institute of Cardiovascular Diseases, Sher-E-Bangla Nagar, Dhaka; [3]Department of Cardiac Anesthesia, Al-Helal Institute of Heart and Medical Science, Mirpur, Dhaka; [4]National Heart Foundation & Research Institute, Mirpur, Dhaka, Bangladesh. Tel: +88-01713000684; e-mail: drasit2005@yahoo.com

DOI: 10.3329/bmrcb.v35i2.2766

References

1. Fulton DR. Congenital heart disease in children and adolescents. In: Hurst's the Heart. Fuster V, O'Rourke RA, Walsh RA, Poole-Wilson P. 12th ed. China, McGraw-Hill Co., 2008, p 1855-1921.
2. Seldon WA, Rubstein C, Fraser AA, The incidence of atrial septal defect in adults. Br Heart J. 1962; 24: 552-62.
3. Bonow R, Borer JS. Left ventricular functional reserve in adults with atrial septal defect: Pre- and postoperative studies. Circulation 1981; 63: 1315-22.
4. Bichell DP, Pelletier G. Atrial septal defect and cortriatriatum. In: Sabiston and Spencer surgery of the chest. Sellke WF, Nido DJP, Swanson SJ (eds). 7th ed. Philadelphia, Anne Lenehan, 2005, pp 1931-44.
5. W. De Mulder, H Vanermen. Repair of atrial septal atrial septal defects via limited right anterolateral thoracotomy. Acta Chir Belg. 2002; 102: 450-54.
6. Grinda JM, Folliguet TA, Dervanian P, Mace L, Legault B, Neveux JY. Right anterolateral thoracotomy for repair of atrial septal defect. Ann Thorac Surg. 1996; 62: 175-78.
7. Massetti M, Babatasi G, Rossi A Operation for atrial septal defect through a right Anterolateral thoracotomy current outcome. Ann Thorac Surg. 1996; 62: 1100-03.
8. Yoshimura N, Yamaguahi M, Oshima Y. Repair of atrial septal defect through a right posterolateral thoracotomy: A cosmetic approach for female patients. Ann Thorac Surg. 2001; 72: 2103-05.
9. Barbero-Marcial M, Tanamati C, Jatene MB, Atik E, Jatene AD. Trans-xiphoid approach without median sternotomy for repair of atrial septal defects. Ann Thorac Surg. 1998; 65: 771-74.
10. Cremer JT, Boning A, Anssar MB. Different approaches for minimally invasive closure of atrial septal defects. Ann Thorac Surg. 1999; 67: 1648-52.

Non-adherence to drug treatment in patients of essential hypertension

We conducted a cross-sectional study on 120 patients (mean age 57 ± 11 years) of essential hypertension at Rajshahi Medical College Hospital and a private clinic. Approximately 69.2% of patients were males. The educational level varied; 32.5% had no education, 19.2% had a primary education, 29.2% had secondary or higher secondary education and 19.0% had a bachelor degree or higher. About one-fourth were unemployed. 77.5% were poor and earning ≤ 10,000 taka per month. The duration of disease ranged from 1 to 30 years and the antihypertensive drugs used by them were different (Table I). Eighty five percent of patients were non-adherent to treatment. The non-adherent patients had missed taking medication for anywhere from one day to the whole month.

Only 1.7% of patients had a good knowledge of the disease, side-effects of drugs and benefits of controlling blood pressure. Seventy five percent of patients knew that uncontrolled hypertension could lead to stroke and heart disease, one-third were aware it could lead to kidney failure. A few (15.0%) knew hypertension can cause retinopathy and peripheral vascular disease (5.0%). Only 3.3% of respondents had a good knowledge of the side-effects of antihypertensive. One-third knew that exercise helps control blood pressure. Two-thirds of patients argued to change their medication only went for follow up visits when they felt hypertensive. Only one-third felt hypertension is not a curable disease. More than half believed the disease should cause certain signs and symptoms and another third were not sure. For the rest regarding understanding the disease, and benefits

and barriers to treatment, most of the beliefs were related with the level of knowledge.

Table I: Adherence to treatment by hypertensive patients

	Number	Percent
Duration of having hypertension		
1-5 years	48	40.0
6-10 years	56	46.7
>10 years	16	13.3
mean ± sd	7.2 ± 5.5 years	
min-max (years)	1 - 30 years	
Types of drugs taken[a]		
Calcium channel blocker	54	45.0
Beta blocker	48	40.0
Diuretic	37	30.8
ACE inhibitor	30	25.0
ARB	29	24.2
Centrally acting drugs	3	2.5
Adherence to medication		
Adherent	18	15.0
Non-adherent[b]	102	85.0
1-5 days/m	29	24.2
6-10 days/m	45	37.5
11-20 days/m	18	15.0
>20 days/m	10	8.3
Reasons for not taking medication[b]		
Forgetfulness	46	38.3
Feeling well	44	36.7
Busy schedule	30	25.0
Poverty	27	22.5
Boredom	17	14.2
Travel	4	3.3
Other reasons to forget	3	2.5
Other specific causes		
Side effects of drugs	1	0.8
Reluctant to take	1	0.8
Reluctant to buy	1	0.8
Place of getting antihypertensives		
Hospital	2	1.7
Drug store	118	98.3

[a]May include more than one; [b]Number of days medication missed per month

Significant factors for determining non-adherence to antihypertensive treatment were study site, levels of education, family income, level of knowledge, believes and understandings regarding the disease, its consequences, side effects of the drugs and benefits of controlling their blood pressure, an accompanying person to go to the hospital and patients education regarding hypertension and its complications by the health care provider (Table II).

Further analysis using multiple logistic regression evaluated the relationship between multiple factors and non-adherence. The site, monthly family income, duration of disease and knowledge played a significant role in the study outcome. When controlling for other variables in the model, those who went to Rajshahi Medical College Hospital had a 30 times greater chance of being non-adherent (95% CI 5.31-169.10); a lower income gave a higher chance of being non-adherent, by 4.96 times. When controlling for other factors we found those with disease knowledge which needed improvement were 23.71 times more likely to be non-adherent (95% CI 3.38-166.46).

At the private clinic the patients are mostly the rich and educated, who followed the instructions and were usually adherent to the medical regimen. The population at the highest risk for hypertension is those over age 30 years[1] and if the disease is left untreated it takes 7-10 years to develop TOD[2]. Generally, females are concerned more about their health than males, but only 30.8% of respondents of this study were female, which reflects gender inequality and discriminatory treatment-seeking practices among females probably[3,4]. Even though most people of Bangladesh are farmers, we did not have many farmers in this study because they are less often seriously ill and never seek treatment.

Patient adherence to treatment is directly linked to family support. In Bangladesh, family cohesion is very high still less than half of the patients were supported by their family members in different aspects may be due to lack of knowledge of the family members about the disease process. This study reflects for most of the patients the present facility is neither affordable nor accessible. Thirty-seven percent missed their appointment because they felt well; this points to a need for improved education regarding the disease. Only 3.3% of patients were given information regarding their disease which was incomplete and inadequate. 38.3% of patients had gone to people other than physicians which emphasizes illegal practices should be discouraged and public services should be made more accessible.

If treatment cost could be reduced, non-adherence must be decreased. Patients should be motivated to

Table II: Association between non-adherence and other factors in hypertensive patients

	Total response	Adherence to treatment		OR	95% CI	
		Yes	No		L.L	U.L
Study site						
RMCH	100	5	95	35.29	9.76	127.63
Private clinic	20	65	35			
Education						
Primary education level or below	62	6.5	93.5	6.34	1.65	24.41
Secondary education level and higher	35	20.0	80.0	1.75	0.52	5.90
Graduate education level and higher	23	30.4	69.6			
Monthly income[a]						
≤10,000 taka	93	6.5	93.5	11.60	3.77	35.65
>10,000 taka	27	44.4	55.6			
Knowledge level[b]						
Good	13	69.2	30.8			
Needs improvement	107	8.4	91.6	24.50	6.28	95.58
Believes and understanding[b]						
Good	75	22.7	77.3			
Needs improvement	45	2.2	97.8	12.90	1.65	100.63
Needs accompaniment to see the physician						
No	15	33.3	66.7			
Always and sometimes	105	12.4	87.6	3.54	1.04	11.99
Information provided regarding hypertension						
No	42	4.8	95.2	5.16	1.13	23.66
Yes	78	20.5	79.5			

[a]1 US $ = 65 Taka; [b]after combining very good and good as good and fair and poor as need improvement; [c]age, sex, occupation, duration of disease, reminder regarding the significance of taking medication, monetary support, money needed to buy medication, time required to seek treatment, and called for a follow-up visit were not statistically significant.

take their medication regularly and follow the lifestyle advised. Patients' beliefs are related to their knowledge[5], therefore improving knowledge should help to decrease non-adherence.

Research emphasizing the cost effectiveness of controlling blood pressure and treating target organ damage should be performed to find out the extent of economic loss due to treatment and rehabilitation of hypertensive target organ damage.

Sultana Monira Hussain[1] and C. Boonshuyar[2]

[1]Department of Community Medicine, Anwer Khan Modern Medical College, Dhaka, Bangladesh; Faculty of Public health, Mahidol University, Bangkok, Thailand. e-mail: smmuku@yahoo.com

DOI: 10.3329/bmrcb.v35i2.3139

References

1. Gregory YH, Lip TGP. Current hypertension. 1st ed. London, Science Press, 2004, pp 80-83.
2. Camm AJ. Cardiovascular diseases. In: Clinical medicine. Kumar P, Clark M. (eds). 6th ed. London, Elsevier Saunders, 2006, pp 857-64.
3. Life expectancy at birth. World Health Organization. 2004. [Cited 2007 Mar 20] Available from: URL: http://www.whoban.org/country_health_profile.html.
4. Hypertension Study Group V. Prevalence, awareness, treatment and control of hypertension among the elderly in Bangladesh and India: A multicentre study. Bull WHO. 2001; 79: 490-500.
5. Sekuler R, Blake R. Perception. 2nd ed. New York, McGraw-Hill Publishing Company, 1990, pp 424-26.