

CARDIAC SURGERY IN ELDERLY PATIENTS

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Abstract

The number of patients undergoing cardiac surgery at older age is increasing. Most of these patients are at advanced stages of coronary heart disease and often suffer from other diseases related to advanced age. This study shows the early post-operative results of cardiac surgery in a group of patients aged 70 years and older, with special attention being paid to those who were over 75 years. This medical care for elderly patients received special support from the Ministry of Health. It is concluded that the careful assessment of all pathological conditions and the degree of risk in each patient before surgery is of great importance.

Key words

Patient selection, Old patients, Coronary surgery, Valvular surgery, Early post-operative morbidity, Early post-operative mortality

INTRODUCTION

The Czech Republic is one of the European countries in which a high increase in cardiac surgery has occurred in recent years. The existing centres report growing numbers of surgical procedures and new centres are developing. In the population treated, the number of old patients who undergo complex and demanding cardiac surgery is higher with every year. The aim of this study is to present data on the patients older than 70 years who underwent cardiac surgery in the Centre of Cardiovascular Surgery and Transplantation in Brno.

MATERIALS AND METHODS

The patients operated on in the period from 1990 to 2002 were placed into three groups according to the surgical procedure performed, i.e., surgery for coronary artery disease (CAD), surgery for valvular disease (VD) and combined therapy (one-stage surgery for coronary and valvular heart disease; CVHD). In each group, patients aged 70 years and older were evaluated separately.

The clinical records of old patients were analysed in retrospect for broader aspects of indication for surgery; in addition to the severity of cardiovascular disease, the presence of accompanying conditions was noted. Particular attention was paid to patients aged 75 years and older.

RESULTS

The numbers of patients in the three groups were as follows: CAD group, 6117; VD group, 3876; CVHD group, 719. The increasing proportions of old patients between 1990 and 2002 are shown in *Table 1*. In 2002, there were 31.6%, 27.8% and 50.9% of the patients older than 70 years in the CAD, VD and CVHD groups, respectively.

The accompanying conditions that had to be taken into account when assessing indications for surgery, because they may affect the early post-operative course in older patients, were identified as follows: mild ventilation disorder in 25.3%, moderate and severe ventilation disorder in 10.6%; vascular brain disease in 36.7%; and renal disorders (creatinine > 120 mmol/l) in 22.1% of the patients older than 70 years. In these patients, the underlying diseases that may have had an effect on the long-term post-operative course were also identified: hypertension, 69.1%; diabetes mellitus, 25.3%; obesity (body mass index higher than 30), 27.6%; and lower-extremity ischaemic disease, 12.9%.

Table 1

Numbers of patients undergoing surgery in the Centre of Cardiovascular Surgery and Transplantation in Brno between 1990 and 2002

Year	CAD group		VD group		CVHD group	
	Total no. patients	Patients ≥ 70 years	Total no. patients	Patients ≥ 70 years	Total no. patients	Patients ≥ 70 years
1990	135	3	179	2	22	0
1991	164	2	186	4	24	3
1992	184	2	186	8	21	1
1993	273	6	265	3	26	4
1994	297	14	293	12	32	4
1995	374	23	293	12	42	3
1996	378	28	330	20	44	6
1997	443	50	389	41	55	11
1998	536	98	397	67	69	22
1999	711	155	357	79	84	30
2000	817	216	315	79	100	43
2001	944	293	283	83	92	52
2002	861	272	403	112	108	55

CAD, coronary artery disease; VD, valvular disease; CVHD, combined coronary artery and valvular disease.

Table 2

Early post-operative morbidity in patients older than 75 years

Underlying disease	Patients affected (%)
Heart failure	36.8
Dysrhythmia	14.7
Post-operative bleeding	7.9
Ventilation problems	6.8
Neuropsychological disorders	6.8
Myocardial infarction	3.4
Renal failure	3.4
Gastrointestinal complications	

The medical care for very old patients was supported by a grant from the Ministry of Health and, therefore, outcomes of cardiac surgery in this age category were evaluated separately. In 2002, 169 patients undergoing surgery at our Centre were older than 75 years; the average age was 77.6 years, the oldest patient being 92 years; of them, 35% were women and 65% were men. Surgery for coronary artery disease was carried out in 61%, for valvular disease in 22.4%, and the combined procedure for CVHD was performed in 16.6% of the patients.

In patients aged 75 and older, early post-operative morbidity was evaluated in relation to most frequent underlying conditions. The results of analysis for the year 2002 are shown in Table 2. The hospitalisation mortality in the oldest patients (n=169) was 5.9% compared with 2.6% in the patients less than 75 years of age (n=1 272) treated in 2002. Also the average duration of post-operative hospitalisation was longer in the oldest patients (13.8 *versus* 9.7 days).

DISCUSSION

In all developed countries of Europe and in the USA, the number of elderly patients undergoing cardiac surgery is increasing (1–6). It has not been established yet at what age the patient is considered old. The age of 70 years, adopted in the USA as the limit for surgery in coronary artery disease, can be used to define our population as “elderly” in terms of cardiac surgery.

While in 1980 no 70-year-old patient was considered for cardiac surgery and in 1990 patients in this age category were still treated only occasionally, in 2002 nearly one quarter and in 2002 more than one third of all patients indicated for cardiac surgery were 70 years and older. As presented here, the number of operations in elderly patients has markedly increased since the mid-1990s. More

than a half of all patients with combined surgery for coronary artery and valvular diseases are elderly subjects.

Older age is an independent risk factor for cardiac surgery (6,7), even though more importance is ascribed to biological than chronological age (1,8). It is associated with a higher early post-operative mortality, which may range from 5.6% to 15.1% according to the selection criteria of different centres specialising in cardiac surgery (5,9–13). Generally, most of the elderly patients before surgery are in functional classes III or IV and they undergo surgery only after all means of pharmacological therapy have failed (9), which is in agreement with our experience. In elderly patients, decision making for cardiac surgery should also include their neuropsychological state, active approach to one's own health, motivation for surgery and social background. In addition to cardiovascular findings, it is also necessary to consider accompanying diseases because the functional states of the lungs, brain and kidney play a crucial role in the early post-operative outcome (14). Our results showed that, at higher age, these organs are often affected. Further conditions that have to be attended to in elderly patients are hypertension, diabetes mellitus and obesity.

Special attention was paid to patients older than 75 years, whose treatment was supported by a grant from the Ministry of Health. The number of patients in this age category who undergo cardiac surgery has recently increased, as has the number of all elderly patients operated on for other causes. In 2002, this group accounted for 11.7% of all patients treated at the Centre of Cardiovascular and Transplant Surgery. They all are at increased risk due to accompanying diseases and, most of them are in functional class III/IV.

In our older patients, early post-operative mortality did not differ from that in younger patients and similar findings have been reported by other authors (2,4,10). However, the course of recovery was slower and duration of hospital stay was longer, which made the costs of treatment higher. It is estimated that, in patients older than 70 years, these costs are on average higher by 15% than those in younger patients. Almost all younger patients are generally discharged to home care but this is not the case in old patients. Of our elderly patients, nearly one quarter was referred to internal medicine or geriatric wards of hospitals in their home area.

In patients aged 75 and older, the outcomes of treatment at our Centre (2,3), as evaluated at one year after cardiac surgery, were similar to the results reported from other centres specialising in cardiac surgery (5,11,12,13,15). However, a one-year follow-up period is too short to draw any reliable conclusions. Some authors suggest (9,11) that five or more years are needed before it can be decided whether or not this demanding cardiac surgery is beneficial to the majority of older patients.

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OPERACE SRDCE VE STÁŘÍ

Souhrn

Počet starších nemocných, kteří podstupují operaci srdce, rok od roku narůstá. Většina těchto nemocných se nachází v pokročilé fázi srdečního onemocnění a často trpí přidruženými onemocněními, která jsou ve vyšším věku častá. V předoperační rozvaze je třeba zvážit všechny tyto okolnosti a stanovit individuální riziko pro každého takového pacienta. V práci předkládáme časné výsledky operací srdce nejen nemocných 70-letých a starších, ale i výsledky u skupiny 75-letých a starších v rámci řešení grantu Ministerstva zdravotnictví.

REFERENCES

1. Emde von der J, Esperer HD, Rein J, Eberlein U. Cardiac surgery interventions in patients over 70 years of age. *Fortschr Med* 1991; 109: 500–503.
2. Frélich M, Štětka F, Pokorný P, Útrata P, Bedáňová H, Ondrášek J, Němec P, Šimková M, Wagner R, Pavlík P, Černý J. Kardiologické výkony na chlopních u nemocných 75letých a starších. Časné a krátkodobé výsledky. [Cardiac surgery in valvular disease in patients aged 70 years and over. Early and short-term results]. *Cor Vasa* 2003, Suppl 45: 4.
3. Frélich M, Štětka F, Němec P, Ondrášek J, Wagner R, Šimková M, Černý J. Přináší chirurgická revaskularizace myokardu bez mimotělního oběhu benefit u starších nemocných? [Do elderly patients benefit from myocardial revascularization performed without extracorporeal circulation?] *Cor Vasa* 2003, Suppl 45:4.
4. Mortasawi A, Rosendahl U, Schroder T, Albert A, Ennker IC, Ennker J. Isolated coronary bypass operation in the 9th decade of life. *Z Gerontol Geriatr*. 2000; 33: 381–387.
5. Vermeulen T, Rodrigus I, Stockman B, Amsel B, Moulijn A. Cardiac surgery in octogenarians. *Acta Cardiol* 2001; 56: 367–373.
6. Kolh P, Kerzmann A, Lahaye L, Gerard P, Limet R. Cardiac surgery in octogenarians : peri-operative outcome and long-term results. *Eur Heart J* 2001; 22: 1235–1243.
7. Tsai TP, Blanche C. Cardiac surgery in patients aged at least 80 years. *J Formos Med Assoc* 2002; 101: 313–321.
8. Frélich M, Štětka F, Němec P, Wagner R, Šimková M, Černý J. Pohled kardiologa na kardiologický výkon u starších nemocných [Cardiologist's view on cardiac surgery in elderly patients]. *Cardiol* 2001; (Suppl.1): 85.
9. Craver B, Puskas JD, Weintraub WW, Shen Y, Guyton RA, Gott JP, Jones EL. 601 octogenarians undergoing cardiac surgery: outcome and comparison with younger age groups. *Ann Thorac Surg* 1999; 69: 317–318.
10. Tanaka M, Kawahito K, Adachi H, Yamaguchi A, Ino T. Cardiac surgery in patients aged 80 years and older *Jpn J Thorac Cardiovasc Surg* 2002; 50: 508–512.
11. Fruitman DS, MacDougall CE, Ross DB. Cardiac surgery in octogenarians: can elderly patients benefit? Quality of life after cardiac surgery. *Ann Thorac Surg* 1999; 6 : 2129–2135.
12. Mortasawi A, Gehle S, Schroder T, Ennker IC, Rosendahl U, Dalladaku F, Bauer S, Albert A, Ennker J. Aortic valve replacement in 80- and over 80-year-old patients. Short-term and long-term results. *Z Gerontol Geriatr* 2000; 6: 438–446.
13. Zaidi AM, Fitzpatrick APOD, Keenan DJ, Odom NJ, Grotte GJ. Good outcomes from cardiac surgery in the over 70s. *Heart* 1999; 2: 119–120.
14. Poveda JJ, Calvo M, Llorca J, Bernal JM. Pre and perioperative factors determining early in-hospital mortality in patients over 75 years of age undergoing cardiac surgery. *Rev Esp Cardiol* 2000; 10: 1365–1372.
15. Shigemitsu O, Hadama T, Miyamoto S, Anai H, Sako H, Wada T, Iwata E. Early and long-term results of cardiovascular surgery in octogenarians. *Ann Thorac Cardiovasc Surg* 2001; 4: 223–231.

