

Original article:

Trends in body donation for medical education: 10 year retrospective study

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ABSTRACT

Introduction: Dissection of cadavers is an integral part of medical education. Modern imaging techniques may have lead to better understanding of disease processes but knowledge of the normal structure of human body is acquired best by dissection. Hence a steady supply of cadavers is essential to meet that requirement. Moreover it also helps aspiring surgeons to practice new techniques and hone their skills.

Methodology: Profile of 225 voluntarily donated cadavers were studied through a ten year period at our institute. Age, sex and fate of those cadavers were noted and relevant numerical data were derived.

Results: More male cadavers were donated than females. However both youngest and oldest cadavers were females. The average age of cadavers was 68.57 years. An increase in donation was observed from 2004 through 2010. Increase in cadavers leads to greater availability of dissection.

Conclusion: Present trend of voluntary body donation is mostly sufficient for dissection as well as for supply to other medical institutions. Supply of bones and viscerae are in shortfall. There is a scarcity of female and young cadavers which need to be overcome. Efforts must be sustained to motivate more people to bequeath their bodies to meet future demands by new medical institutions for dissection and advancement of medical science.

Keywords: cadavers, dissection, male, female

INTRODUCTION:

Anatomy is the cornerstone of medical science which is most effectively understood by dissection of cadavers. Medical education in India is strictly regulated by the Medical Council of India (MCI). The first year of medical education includes the subjects of Anatomy, Physiology Biochemistry and Community Medicine of which Anatomy occupies a major portion. The Medical Council of India mandates 650 hours for teaching Anatomy at the undergraduate level compared to 480, 240 and 60 hours respectively for Physiology, Biochemistry and Community Medicine.⁽¹⁾ In our institute 2

hours of each day are exclusively set aside for dissection. Dissection is performed for five days a week over a period of approximately 8 months. Our institute with an annual intake of 200 students per year (150 till 2011) in undergraduate course (MBBS) and 5 students per year in postgraduate course (MD) requires a steady supply of cadavers to facilitate Anatomy teaching as per MCI norms.

Body donation is the major and preferred source of cadavers worldwide.^(2,3,4) Additionally, cadavers are supplied to clinical departments for live workshops and as an adjunct to surgery. They are used for developing new surgical techniques.⁽⁵⁾

Various viscerae removed from cadavers are displayed as museum specimen in the Department and in medical education fairs for enlightening the common person. Only donated cadavers who have pledged themselves when alive and without any objection from the next of kin are accepted. They should have a natural death and free from contagious diseases. The present study attempts to investigate the trends in cadaver donation in this Institution which is so very important in catering to the above mentioned requirements. Lack of data pertaining to body donation in this region of India also prompted us to undertake the study. Body donation programme for medical education is present in many medical colleges in India and also worldwide. The present study attempts to assess the adequacy & profile of cadavers donated to this institution for the purpose of medical education.

MATERIAL AND METHODS:

Details of cadaver donation (name, age, sex, residence, purpose of donation, person donating the cadaver and fate) are recorded meticulously in a register kept for the purpose in the Department of Anatomy. The authors selected a time span of 10 years from 2001 through 2010 for the purpose of the study. The following were recorded in tabular form after manual inspection:

- (a) Total number of cadavers donated each year
- (b) Age and sex of the donated cadavers
- (c) Fate of the cadavers

OBSERVATIONS & RESULTS :

Findings of the study are depicted in Table I. Total cadavers donated during the period of study was 225. Highest number of cadavers were donated in 2010 (55) and lowest in 2004 (7). Male cadavers (161, 71.56%) far outnumbered females (64, 28.44%). Two female cadavers aged 8 years and 103 years were the youngest and eldest

respectively. The average age was 68.57 years. 147 (65.33%) cadavers were dissected and 70 (31.11%) were donated to other medical colleges. Bones were collected from 5 (2.22%) and viscerae were procured from 1 (0.67%). A single cadaver was decomposed (0.67%). The average age of cadavers was 68.57 years. An increase in donation was observed from 2004 through 2010.

DISCUSSION:

Human body is very complex but it conforms to a general pattern. What is described as normal in Anatomy textbooks is found less than half the time.. This does not mean that the rest are “abnormal”. They are variants which are present in many individuals.⁽⁶⁾ These variants are of considerable importance in surgery which if left unrecognized can lead to difficulties while operating on a patient. This problem is best overcome by dissecting greater number of cadavers and there lies the importance of body donation. Moreover paediatric anatomy differs considerably from adult anatomy but very few cadavers are available for studying the former.

In a study from Maharashtra, India a gross insufficiency of cadavers was found in 90.90% of medical colleges.⁽⁷⁾ This can be attributed to a voluntary organization Ganadarpan (meaning *mirror of society*) which is instrumental in spreading awareness and motivating the common people for donating their bodies. It serves as a platform where eminent people from all walks of life pledge their bodies for medical science thereby also motivating the common people to do the same. Some investigators found that older age was negatively associated with willingness to body donation^(8,9,10) The average age in the present study was 68.57 years, which is contrary to other studies. However in a study from Punjab, India 63.04% bodies were of the age group 61 – 90 years.⁽¹¹⁾

TABLE I : Characteristics of cadavers studied

Year	Total no of cadavers	No of male cadavers	No of female cadavers	Lowest age of cadaver with sex	Highest age of cadaver with sex	Average age of cadavers	Fate
2001	10	7	3	30 y, M	75 y, F	53.5 y	D=7, B=1, E=1, Dc=1
2002	24	17	7	25 y, F	95 y, F	67.63 y	D=19, B=4, Do=1
2003	12	11	1	50 y, M	89 y, M	65 y	D=11, Do=1
2004	7	4	3	46 y, F	94 y, M	75.57 y	D=7
2005	10	8	2	60 y, M	90 y, F	76.6 y	D=8, V=1, Do=1
2006	25	7	3	33 y, F	103 y, F	70 y	D=23, Do=2
2007	23	16	7	8 y, F	87 y, F	66.96 y	D=21, Do=2
2008	29	23	6	25 y, M	91 y, M	71.14 y	D=14, Do=15
2009	30	20	10	16 y, M	91 y, F	66.9 y	D=17, Do=13
2010	55	41	14	37 y, F	92 y, F	72.44 y	D=38, Do=17

[B, Bones; D, Dissection; Dc, Decomposed; Do, Donated to other Medical Colleges; E, For examination purpose; V, Viscerae]

In the present study it was 74.67%. This reversal of trend in India compared to other nations is very sharp. This can be partly explained by the attitude of altruism by donors which may become prominent in the elderly people.⁽¹²⁾ Efforts by Ganadarpan may also be more influential to the older age group. Whatever the cause may be it underscores the need for a more positive response from the younger age group. Some investigators observed that donors were predominantly males^(13,14,10) – similar to the present study. This difference in sex distribution can be attributed to the fact that our male dominated society discourages spread of awareness among the women folk.

The increase in number of donated bodies from 2004 through 2010 may be due to more than one reason: apart from Ganadarpan it is the economic burden of performing the last rites of the deceased that leads people to think of this as a very convenient way to fulfil their duties. This also comes with the rich dividend of gaining reputation by contributing oneself to the noble cause of advancement of medical science.

Bones procured from cadavers fall short of the requirements of the Department. An important fact is that cadavers are embalmed within few hours of donation rendering them unfit for extraction of bones. Hence embalming should be done selectively keeping in mind this requirement.

CONCLUSION :

The present study is the first attempt towards creating a database of human bodies donated for the noble cause of medical education. This institute

received mostly male cadavers however female cadavers have a greater range. Cadavers were generally elderly. They were mainly utilised for dissection and donation to other institutions

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Date of submission: 14 June 2013

Date of Provisional acceptance: 05 July 2013

Date of Final acceptance: 30 Aug 2013

Date of Publication: 04 September 2013

Source of support: Nil

Conflict of Interest:

