

## Analysis of medico legal deaths in adolescence: An Autopsy based study at coaching city, Kota

Lalchandra Verma, Vinod Kumar Garg, Sachin Kumar Meena

*1 Department of Forensic Medicine and Toxicology, Govt Medical College, Kota, Rajasthan, India*

### Abstract

An adolescent is defined as an individual aged between 11-19 years. They constitute about 1.2 billion worldwide, and about 21% of Indian population. Mortality and morbidity occurring in this age group are mostly due to preventable causes. Mortalities in adolescents are cause of concern because they are the future of nation forming a major demographic and economic force. The purpose of this study is to analysis mortality in adolescents. Out of 1056 autopsies 94 victims were adolescents contributing 8.9% of total autopsies. Male deaths were more (about 60%) than female (about 40%) and all deaths increased with an increase in age. More than half of the total deaths (51%) were due to accidents, followed by suicides (43%). Females were prone to commit suicides. In suicidal deaths the most common cause was hanging following by poisoning. Use of appropriate safety measures and strict law enforcement may significantly reduce accidental deaths in adolescents. Suicides and homicides may be prevented by identification of risk factors, significant family support and proper psychological counselling.

### Keywords

Adolescent mortalities; Accidental deaths; Suicidal deaths.

### Introduction

Adolescence is a transitional stage of physical, physiological and psychological development from puberty to adulthood.<sup>1</sup> WHO defines an adolescent as an individual aged between 11-19 years i.e. those in the second decade of their lives. Around 1.2 billion people, or, one in six of the world population belongs to the adolescent group. In India about 21% (243 million) of population are adolescents.<sup>2</sup> The period of adolescence and puberty has a special importance because it is the most beautiful, most powerful, and most hopeful period of human life.<sup>3</sup> Mortality and morbidity occurring in this age group is mostly due to preventable causes. Studies showed that about 70% of deaths among adolescents were due to preventable causes such as unintentional injuries, homicides and suicides.<sup>4</sup> This is a cause for concern as adolescents are the future of our nation and they constitute the major demographic and economic force. The purpose of this study is to analysis medico legal deaths in adolescents. This study might help provide invaluable information and may be used by society and law enforcement authorities to prevent such mortalities. The aims and objectives of the present study were to analyse the socio-demographic profile of victims of medico-legal deaths of adolescents and to analyse causes and manner of medico-legal deaths in adolescents and learn how to prevent such mortalities.

### Material and Methods

The present study was conducted at the Department of Forensic Medicine, M.B.S. Hospital associated with Government Medical College Kota, Rajasthan. This study was conducted between 1<sup>st</sup> January 2019 and 31<sup>st</sup> December 2019 after obtaining ethical approval from the Institutional Research and Ethical Committee. All dead bodies brought for medico-legal post-mortem examination of adolescent victims (10-19 years) at M.B.S. Hospital mortuary were included in the study after obtaining an informed consent for participation in the study by relative of deceased. Cases wherein history regarding manner and cause of death were incomplete along with cases where no consent was obtained were excluded. Detailed information regarding circumstances of death was sought. The post-mortem examination was carried out and obtained information was correlated with the history and details mentioned in the police inquest. All collected data was then processed using Microsoft Excel and tabulated to deduce findings of the study.

### Results

In the present study we analysed medico-legal deaths in adolescents (10-19 years) in Kota city of Rajasthan during the period of 1<sup>st</sup> January 2019 to 31<sup>st</sup> December 2019. Total 1056 autopsies were conducted during this study period.

Of the 1056 autopsies 94 victims were adolescents, contributing 8.9% of total autopsies. Male deaths were more with 56 cases (about 60%) as compared to female deaths with 38 cases (about 40%). The study showed that 76 (80%) deaths belonged to 15-19 years age group and only 18 (20%) deaths belonged to the 10-14 years age group. Maximum deaths (23; 25%) were observed in 18 year age followed by 19 year age (21deaths;

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### Corresponding Author

Dr Vinod Kumar Garg (Assistant Professor)

Email: gargvinod85@gmail.com

Mobile no: 9413954851

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22%). Only one case was observed in 11 year age. These observations show that deaths increased with increase in age (Table 1).

**Table 1:** Age-wise distribution of adolescent deaths

Age (years)	Male	Female	Total
10	1	1	2
11	1	0	1
12	3	1	4
13	4	1	5
14	4	2	6
15	3	4	7
16	4	4	8
17	12	5	17
18	14	9	23
19	10	11	21
Total	56	38	94

**Table 2:** Distribution of victims according to manner of death

Manner of death	Male	Female	Total
Accidental	37	11	48
Suicidal	15	25	40
Homicidal	04	02	06
Total	56	38	94

**Table 3:** Manner of death distributed according to age of victims

Age (years)	Accidental	Suicidal	Homicidal	Total
10	1	1	0	2
11	1	0	0	1
12	2	1	1	4
13	3	1	1	5
14	4	2	0	6
15	4	3	0	7
16	3	5	0	8
17	5	10	2	17
18	14	8	1	23
19	11	9	1	21
Total	48	40	6	94

We also analysed manner of death and it was observed that maximum deaths with 48 cases (51%) were due to accidents followed by suicidal deaths (40 cases; 43%). Least number of deaths (6) occurred due to homicide. Out of the 48 accidental cases male deaths were more, with 37 cases (77%) as compared to females (11 cases; 23%). We also observed that female deaths were more due to suicides (25 cases; 63%) than males (15 cases; 37%) cases. In case of homicide there were 4 male adolescents and 2 female adolescents (Table 2). Maximum suicidal deaths in adolescents were observed in the 17-19 years age group and least deaths were in 10-13 years age group. In case of accidental deaths maximum deaths were observed in 18-19 years age group (Table 3).

**Table 4:** Age-wise distribution of cause of death in adolescents

Cause of death	Age (years)										Total
	10	11	12	13	14	15	16	17	18	19	
Injuries (n)	0	1	2	3	2	3	3	5	8	8	35
Poisons (n)	0	0	0	1	3	3	1	6	4	3	21
Snack bite (n)	1	0	1	0	0	0	0	0	2	1	5
Hanging (n)	0	0	0	1	1	1	2	6	7	4	22
Drowning (n)	0	0	0	0	0	0	1	0	1	1	3
Aspiration (n)	0	0	0	0	0	0	0	0	0	1	1
Burn (n)	1	0	1	0	0	0	0	0	0	2	4
E.C. (n)	0	0	0	0	0	0	1	0	1	1	3
Total	2	1	4	5	6	7	8	17	23	21	94

**Table 5:** Manner of death wise distribution of cause of death

Causes	Accidental	Suicidal	Homicidal	Total
Injuries	29	0	6	35
Poison	8	13	0	21
Snack bite	5	0	0	5
Hanging	1	21	0	22
Drowning	0	3	0	3
Aspiration	1	0	0	1
Burn	1	3	0	4
E.C.	3	0	0	3
Total	48	40	6	94

In this study we also analysed causes of death in adolescents and observed that maximum deaths occurred due to injuries (35 cases) followed by hanging with 22 cases. Out of the 35 deaths due to injuries most injuries were accidental in manner contributing to 83% deaths. According to the body part fatal

injuries were found on the thoraco-abdominal region in 16 cases and in 15 cases fatal injuries were located on the head. Only in four cases injuries were observed over limbs. 21 deaths resulted due to poisoning, out of which 13 cases were suicidal and 8 cases were accidental in manner. We also found 5 deaths due to snake bite, 3 deaths due to drowning and 4 deaths as a result of fatal burns. 3 deaths were a result of electrocution and one death was due to accidental aspiration of gastric contents. We observed 22 deaths due to hanging, out of which 21 cases were suicidal and only one death was due to accidental hanging (Table 4, 5).

## Discussion

Adolescence is a uniquely human phenomenon. Adolescents are known to be moody, insecure, argumentative, impulsive, reckless and rebellious. In this age group testosterone and oestrogen give rise to a competitive streak, adventure, sexual excitement to opposite sex, and at the same time depression.<sup>5</sup> These changes increase violence and mortality rate in adolescents. Medico-legally this age group occupies a very important area of study.

In this study 94 deaths were related to adolescence age group contributing 8.9% of total autopsies. Rao et al. conducted their study on teenage deaths and observed less deaths (3.4% of total autopsies) around Guntur, Andhra Pradesh. A higher number in our study is expected as Kota is the coaching city of India and hence more adolescents are living in Kota and preparing for different competitive examinations. This results in higher adolescent population density in Kota as compared to other cities.

In our study male deaths were more than female deaths and all deaths increased with an increase in age. Similar result were observed by Rao et al.<sup>5</sup> and Ulucay et al.<sup>3</sup> In the latter adolescence phase of 15- 19 years, due to the gradual increase in exposure to outer world, journey to different places with friends and varying employment opportunities adverse influences affect adolescents, and so deaths were higher in this age group.

We analysed manner of death and observed that maximum deaths were due to accidents (51%) followed by suicide (43%) and homicide (6%). Similar findings were observed in the study published by National adolescent health information centre in 2003. According to this study about 45% deaths among adolescents were due to unintentional injuries and vehicular accidents.<sup>4</sup> Blum<sup>6</sup> conducted a study in United States and found similar observations of 48% deaths in adolescence and young adults due to unintentional injuries. In our study deaths due to suicide were 43% and due to homicide were about 6%. Similar findings were observed by Rao et al.<sup>5</sup> and Ulucay et al.<sup>3</sup> Blum<sup>6</sup> on the other hand observed that more deaths, 13% were due to

homicide and less deaths 11% were due to suicide. Here in India parental and social restrictions are there to control the adolescents and it is difficult to get dangerous weapons and so the homicidal deaths were slightly less. In the present study suicidal deaths were very high (43%) compared to foreign studies. This is explained by the fact that socio- cultural and other factors such as study pressure, love and parental pressure are more in Indian scenario. We also observed that female deaths were more due to suicides. Female adolescents have been facing more problems like sexual assault, love failure, unwanted marriage, unwanted pregnancies and less emotional support by family members. These factors lead to increased suicidal deaths.

In this study most common cause of accidental deaths was injuries to thoraco-abdominal region and head injuries. Head and trunk are vital and vulnerable part of body, so proper protection of these parts of body is necessary during driving of vehicles. Helmet and seat belt are important protective gear in protecting the head and trunk. Patel<sup>7</sup> studied that this age group usually travelled by own vehicle or public transportation for work and this leads to road traffic accidents. In suicidal deaths most common causes of death were hanging and poisoning. Ulucay et al.<sup>3</sup> also found most common cause of death was hanging. Tiwari et al.<sup>8</sup> conducted a three years study on suicidal asphyxia deaths in Kota and found similar number of deaths by hanging and drowning. Sharma et al.<sup>9</sup> studied deaths in North India and found poisonings were most commonly used for committing suicides. Contrary to this study guns were used in about 66% of all suicides in USA.<sup>3,10</sup>

## Conclusion

In this study 8.9% of total autopsies were on adolescents. Male deaths were more than females and all deaths increased with an increase in age. 76 (80%) deaths belong to the 15-19 years age group and only 18 (20%) deaths belong to the 10-14 years age group. 48 adolescents died due to accidental or unintentional injuries out of which 37 victims (77%) were male. 40 (43%) deaths were recorded as a result of suicide. Suicidal deaths were more in 17-19 year old female adolescents. Most common method used to commit suicide was hanging followed by poisoning. Only six deaths occurred as a result of homicide. Suicides and homicides in adolescents may be prevented by identifying risk factors (mood disorder, impulsive behaviour), through family support and proper psychological counselling.

Majority of adolescents deaths were due to preventable causes. Motor vehicle accidents and accidents at work place were the leading cause of death. Efforts for prevention of accidents by using safety measures and strict law enforcement may significantly reduce mortalities in adolescents. Suicides and homicides in adolescents may be prevented by identifying risk

factors (mood disorder, impulsive behaviour), through family support and proper psychological counselling.

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