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AN INTERESTING STUDY ON BURNS PATIENTS

Forensic Medicine

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ABSTRACT

Aim&objectives- A study done on burns patients for various reasons and histopathological changes on these burnt specimens.
Materials &methods-A prospective study of 15 patients sustaining burns for several reasons.Sections were taken from representative areas stained were taken stained by Haematoxylin and eosin, studied under microscope for histopathological changes
Results-On analysing the available data it is observed that the deaths due to burns are common in females. Out of 15 cases subjected to close study by taking into consideration the relevant documents it is seen that accidental causes accounted for most of them, followed by suicidal
Conclusions- Histopathological examination of various organs has not been found to be of much value since no specific changes could be detected to indicate whether the death resulted from suicide, accident of from homicide. However some useful findings were noticed in sections of the lungs, kidneys, adrenals, skin and liver.

KEYWORDS

burns, histology,pathology

INTRODUCTION

Burn injuries are a significant public health problem associated with high morbidity and mortality.[7,8,10,17] In a comprehensive study in Europe, the incidence of major burns was reported to be 0.2-2.9 per 100,000 individuals, with flash burns, scalds, and contact burns being the most common types of burns, and higher mortality being associated with older age, the extent of the burns, and the presence of chronic diseases.[18]

In developing countries, burn-related deaths often occur within younger age groups.[7,9,10,11] In developed countries, on the other hand, such deaths are more common among children and the elderly.[16,11]

The incidence of deaths in India is unfortunately high and many factors are responsible for this, important among them being widespread illiteracy, poverty, overcrowding, unemployment and lack of adequate health care facilities. To this formidable list should be added the pestilence of hoary and out-dated customs and rituals that aggravate morbidity and mortality. This is particularly so with deaths due to burns. The obnoxious and ubiquitous practice of dowry has perpetuated a new and alarming rise in mortality from burns – the so called "dowry deaths". In a marriage, where the husband is disgruntled and dissatisfied with a paltry dowry where he had been promised more or imagines that he is entitled to get more, a dangerous situation arises. In order to marry a wealthier girl he would have to divorce his wife, a cumbersome procedure as far as Indian law is concerned. So he is left with only recourse of action and that is to get rid of her by harassing, murdering. In many cases a probable instigating factor is that of the mother-in-law, relatives and husband. The method frequently employed to murder the girl, is to set the hapless victim on fire. This may stem fire from the fact that most of the cases can be manipulated to seem accidental or suicidal and a difficult task to prove otherwise even when there is strong ground for suspicion. This had led to its widespread popularity and the problem has assumed such immense proportion that in every few days newspapers come out with grisly details of yet another case of "bribe burning". Adding to the complexity, the matter is of fact that immolation is a popular method for suicide especially among women

For this purpose various factors should be studies like extent, distribution and nature of the burns and the tissues should be submitted to histopathological examinations. To mitigate some of these problems, I have taken up this topic with special emphasis on the histopathological aspects. I have chosen certain organs, which receive the crust of injury in the case of burns and subjected them to detailed histopathological examination in order to try and arrive at some helpful conclusions that can aid in unnerving some of the vexatious issues.

MATERIALS AND METHODS

Multiple bits of 4-5 mm thickened were taken from each of the following organs. They are skin, lungs, liver, kidney and adrenals. Tissues were fixed routinely in 10% formalin. They were then processed in auto-Tecnicoon. Dehydration was done by ascending grades of isopropyl alcohol and then cleared in three changes of xylene. Tissues were then impregnated with paraffin, which has a melting point of 58^0C the blocks were embedded in paraffin, after ensuring correct orientation. Blocks were then trimmed after removing the moulds. These blocks were then attached to wooden blocks.

Thin sections were cut (5 microns in thickness) routinely on Weswox rotary microtome. The sections were floated in a water bath maintained at 56^0C. Sections were then picked up on a glass slides previously made adhesive with Meyers egg albumin.

Multiple sections from each tissue block were studied using special stain wherever necessary. Routinely sections were stained with haematoxylin and eosin

	DEGREE OF DAMAGE	Dupuytren Classification	Hebras Classification	Modern Classification
A	Superficial redness	I Degree	I Degree	Superficial
B	Vesication	II Degree	I Degree	Superficial
C	Destruction of Superficial Skin	III Degree	II Degree	Superficial
D	Destruction of whole skin	IV Degree	II Degree	Deep
E	Destruction of muscle	V Degree	III Degree	Deep
F	Destruction of bone	VI Degree	III Degree	Deep

RESULTS

S.No	Skin	Lungs	Liver	Kidney	Adrenals
1	Dermis shows coagulative necrosis and destruction of the dermal appendages	Shows marked vascular congestion of the alveolar septal blood vessels and haemorrhages	Central vein and sinusoids show congestion	Shows albuminous degeneration	Shows vascular congestion and haemorrhage
2	Dermis shows coagulative necrosis	Shows congestion of the alveolar septal blood vessels and haemorrhages	No specific changes were seen	Shows albuminous degeneration	Vascular congestion and haemorrhage
3	Dermis shows coagulative necrosis	Shows pulmonary oedema	No specific changes were seen	The convoluted tubular Shows albuminous degeneration	Shows Vascular congestion haemorrhage, focal areas of necrosis
4	Dermis shows coagulative necrosis and destruction of the dermalappendages	Shows pulmonary oedema	Shows sinusoidal congestion	Shows albuminous degeneration	Shows Vascular congestion haemorrhage, focal areas of necrosis
5	Dermis shows coagulative necrosis	Shows pulmonary oedema	Shows albuminous degeneration	Shows albuminous degeneration and casts in the tubules	Vascular congestion and haemorrhage
6	Dermis shows coagulative necrosis	Shows pulmonary oedema	Sows normal architecture	albuminous degeneration seen	Normal morphological features
7	Dermis shows coagulative necrosis	Shows pulmonary oedema	Normal architecture is seen	Shows albuminous degeneration	No changes
8	Dermis shows coagulative necrosis and destruction of the dermalappendages	Shows marked vascular congestion oedema	Normal	Shows albuminous degeneration	Normal featuers
9	Dermis shows coagulative necrosis	pulmonary oedema seen	Shows portal triaditis	Albuminous degeneration	No changes
10	Dermis shows coagulative necrosis	Vascular congestionhaemrrhages Pulmonary oedema	Shows focal areas of necrosis	Convoluted tubular epithelium, shows AlbuminousDegeneration	Shows Vascular congestion haemorrhage, focal areas of necrosis
11	Shows coagulative necrosis of dermis	Shows Vascular congestion haemrrhages Pulmonary oedema	Focal necrosis is seen	Albuminous degeneration is seen	Normal
12	Shows coagulative necrosis	Shows pulmonary oedema	Normal architecture	Albuminous degeneration is seen	Normal appearance
13	Dermis shows coagulative necrosis	Shows Vascular congestion haemrrhages Pulmonary oedema	Normal architecture	Albuminous degeneration is seen	Shows Vascular congestion and focal areas of necrosis
14	Shows coagulative necrosis of dermis	Shows congestion of the alveolar septal blood vessels and pulmonary oedema	Shows albuminous degeneration	Albuminous degeneration is seen	Vascular congestion haemorrhage, focal areas of necrosis are seen
15	Entire thickness of epidermis is destroyed Vesiculation is seen between the degeratedepidemis and dermis. Dermis shows coagulative necrosis	Shows Vascular congestion haemrrhages Pulmonary oedema	Shows congestion	Albuminous degeneration	Shows Vascular congestion haemorrhage, focal areas of necrosis

DISCUSSION

According to World Health Organization's description - accident is described as “a circumstance that was not planned before and not expected but resulted with injury”.[1]

Most frequently the victims, who are aged between 20-44 require emergency medical assistance due to job accidents.[2]

Skin, which has the greatest exposure to one's body has various important functions. If integrity of this organ is breached for any of the above reasons, physiopathologic changes may happen which can result in death.[11] There are number of factors which determine mortality and morbidity caused by burns. Patient's age, the degree of burn and the percentage of the affected area are the paramount factors. Trauma experts who deal with burn traumas voiced their opinion that the best thing one can do is to avoid being burned in the first place.[3]

In various studies, it is stated that the severity of burns and percentage of the affected area are the two most important factors which influence prognosis. A greater affected area is more fatal than a localized but severe burn. If the burnt area is 50% at 1st degree, fatalities are near to 50%.[4,5]

If affected area is 20% and second degree, or 10% and 3rd degree there is a risk of fatality.[6]

Among the burn-related deaths observed in the present study, 87.1% were caused by accidents while 12.9% were caused by suicide. Females (80%, n =12) are involved most commonly than males(20%, n=3). It has been reported that 14–15% of deaths occurring among females in India are associated with burns,[7] and suicide associated burn injuries rank third with a frequency of 11.4%.[8] According to the study by Büyük et al.,suicide has been associated with 6.3% of burn cases.[9]

Within a period of 20 years, 6.9% of the deaths evaluated in this study were caused by burns. Similar studies have reported a burn-related mortality ratio of 2.0– 9.4%. [8,10,11, 12] These studies have reported no difference between military and civilian mortality rates, and it has been reported to be ranging between 5% and 10%.[12,15] The fact that burn-related deaths were reported as an important public health concern in India explains the variability in the frequency of burn-related deaths in the literature.[10,7,11]

Flame burn is the most common cause of burns,[10,14,15] and it has been reported to be often accompanied by inhalation burn. [16,12] In parallel to the literature, flame burns were the most common type of burn in the present study, with a frequency of 90.3%, while inhalation burns were observed in thirteen of the cases (41.9%).

SUMMARY

On analysing the available data it is observed that the deaths due to burns are common in females. Out of 15 cases subjected to close study by taking into consideration the relevant documents it is seen that

accidental causes accounted for most of them, followed by suicidal. In many cases of alleged suicide, when questions were put to the relatives of the deceased a hostile attitude was often noticed which arose suspicion of foul play. In some of these cases it is a fact that the deceased, forced to give false account of the cause of death to make it appear accidental once, which in all probability was clear-cut suicide.

Histopathological examination of various organs has not been found to be of much value since no specific changes could be detected to indicate whether the death resulted from suicide, accident of from homicide. However some useful findings were noticed in sections of the lungs, kidneys, adrenals, skin and liver.

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