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An analysis of post-burn problems in patients attending the OPD of a tertiary level care center

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Background: To analyze post-burn problems of patients and to prepare a protocol and guidelines for the patient and attendants during hospitalization for timely intervention and to prevent the post-burn sequels and therapeutic measures with reconstructive surgical options like skin flap, skin grafting, etc. in patients attending OPD after healing of burns. **Methods:** A prospective observational analysis was conducted, patients were analyzed and assessed with the help of a preformed questionnaire. Throughout this period a number of characteristics were evaluated on attending for an outpatient department like sex, age, social status, skin color, site, causes of burn, types of post-burn complications, psychological and social effects of burn on the patient, etc. **Results:** thermal burn (84%) is the most common cause of burns. Post-burn complications were most commonly seen in females of age group 15-30 years (77.27%), while it is more common in males of age group 30-45 years (52.63%). Post-burn complications were more common in the rural population of the low socio-economic group (61%). **Conclusion:** Burns is a major concern for society and poses many psychiatric, social , aesthetic, and functional problems. The best approach is to avoid /prevent burns and when occurs, then it should be dealt with the utmost care and a holistic approach with proper concealing and rehabilitation is needed for these patients.

Keywords: Psychiatric, Social, Aesthetic Functional, Holistic Approach, Rehabilitation

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Introduction

The incidence of burn-in India is approximately 60-70 lacs per year making it second only to Road traffic accidents for causing the largest groups of injuries [1]. Only 10% of these injuries are life-threatening and required hospitalization in which 50% of these do not survive post-burn complications. Those who survived not only witnessed painful damage to their body parts but also have devastating effects on their personal psyche and emotions. About 1 to 1.5 lac people get crippled and require multiple surgeries and prolonged rehabilitation [1]. The survival victims may develop post-burn complications for which they need to attend OPD in various hospitals for their management [2,3].

The post-burn complications in Patient attending OPD can mainly be classified as:

- Physical complications
- Aesthetic complications
- Psychological and emotional complications
- Social complications.

The phase of management in hospitalized patients is painful and uncomfortable but also after discharge from the hospital out in the society where everyone wants to look glamorous and fit; the patients felt difficult to adjust in society [4,5]. Many of these burn injuries are preventable and simple precautions are enough to avoid these burn accidents. Most burn injuries are accidentals with mostly in the kitchen or where children play with the inflammable items. Well established Burn Unit where burn patients are immediately getting the best management and care have better survival and rehabilitation rates.

But a patient with low socio-economic background especially living in the interior of villages where burn injury management in primary and secondary centers level is sub-standard; these patients have high morbidity and mortality rates [6]. Based on the risk factors the burn injuries should be prevented by modifying these risk factors. Tight-fitting clothes in the kitchen, improve safety standards in the kitchen, supervision on children around inflammable items/kitchen, education on prevention and primary management of burns, etc are some measures to avoid burn injuries.

In 1992, the National Academy of Burn India (NABI) was formed with the aim to reduce the incidence of Burns by generating safety awareness amongst masses and to improve the burn care through research and training of Surgeons, nurses, and paramedical staffs. National Programme for Prevention of Burn Injuries (NPPBI) is set to start soon under program division in the Directorate General of Health Services [6].

Materials and Methods

Source of Data: All consecutive post-burn patients attending follow up an outpatient department in the department of burn and department of surgery at Hamidia Hospital, Bhopal, Madhya Pradesh, India were included in this study.

Inclusion Criteria: Patients attending Surgical and Burn OPD at Hamidia Hospital, Bhopal, Madhya Pradesh, India

Exclusion Criteria: Patient above 70 years.

The prospective observational analysis is conducted on the clinical records of patients attended in the department of burn and plastic surgery, department of surgery, and pediatric surgery for follow up as outpatient from January 2017 to september 2018 at Hamidia Hospital, Bhopal.

The patient came in the OPD and was analyzed and assessed with the help of a preformed questionnaire. The present study used a standard Proforma for the collection of data regarding post-burn complications during their clinical visits in the outpatient department of surgery and the department of pediatric surgery.

Throughout this period a number of characteristics were evaluated on attending for an outpatient department like sex, age, social status, skin color, site, causes of burn, types of post-burn complications, psychological and social effects of burn on the patient, etc

Results

- Thermal burn (84%) is the most common cause of burns. Post-burn complications were most commonly seen in females of age group 15-30 years (77.27%), while it is more common in males of age group 30-45 years (52.63%). Post-burn complications were more common in the rural population of a low socio-economic group (61%).
- The most common psychiatric and behavioral problem is Depression (36%). The incidence

Of social problems in post-burn survivors is most commonly occupational i.e., not being accepted back in the job (35%) in males while in females not accepted in society (13%).

- Aesthetic problems that were found in burn patients were that 74 out of 100 patients had a loss of hair, hypopigmentation was present in 46 patients, the hypertrophic scar was found it in 39 patients, hyperpigmentation was found in 33 patients, and keloid in 23 patients.
- Functional problems related to head and neck in burn patients were found that neck was most commonly involved in 19 patients followed by eyelid involvement in 4 patients. Among functional problems related to chest and thorax pulled up breast were present 22 patients.
- Functional problems in the axilla in the post-burn patient were majorly anterior axillary fold contracture in 17 patients. Among functional deformities in upper limb foot contractures were found in 23 cases followed by ankle contractures in 18 cases and hip and knee contractures in 7 cases each. There were 3 cases of groin contracture and 2 cases of perineum contracture.

Table 1: Socioeconomic distribution of patients.

Sex	HIGH		LOW		Total number of patients
	No. of patients	(%)	No. of patients	(%)	
Male	12	38.71%	27	39.13	39
Female	19	61.29%	42	60.86	61
Total	31	100%	69	100	100

Females of Age Group are 15-30 and 31-45 are most commonly affected. Males of Age Group 1-14 and 31-45 and the elderly are most commonly affected.

Table 2: Occupation wise distribution.

Occupation	Number of patients		Percentage	
Employed	18		18	
Housewife	32		32	
Dependent (elderly/children)	38		38	
	12	26	31.57	68.42
Unemployed	12		12	

Table 3: Distribution of psychiatric problems.

Diagnosis	Number of patients	Percentage
Post-traumatic stress disorder	8	8
Major depression	36	36
Anxiety	14	14
Schizophrenia	5	5
Substance abuse	16	16
Nightmare	22	22
No Psychiatric disorder	31	31

Table 4: Distribution of social problem.

Social problem after healing of burn (Not accepted)	Number of patients	(%)
Not accepted in the family	9	7%
Not accepted in jobs	37	35%
Not accepted in society	15	13%
Feeling Guilt	19	17%
Others	28	28%

Table 5: Aesthetic problems in burn patients.

Aesthetic Problems	Aesthetic Problems	Number of Patients	(%)
Scar	Keloid	23	23
	Hypertrophic Scar	39	39
Pigmentation	Hyperpigmentation	33	33
	Hypopigmentation	46	46
Loss Of Facial Feature	Loss Of Hairs	74	74%
	Loss Of Ears	4	4%
	Loss Of Nostrils	2	2%

Table 6: Function problems in burn patients

A) Head and neck

Head and neck	Number of patients	Percentage
Eyelid	4	4
Nose	1	1
Lips	3	3
Neck	19	19

B) Chest and thorax

Chest and thorax	Number of patients	Percentage
Fusion (Symmastia)	0	0
Pulled up breast	22	22

C) Upper limb

Upper limb		Number of patients	Percentage
Axilla (24)	Anterior	17	17
	Posterior	2	2
	Both	5	5
Elbow (15)	Flexion	15	15
Wrist (20)	Flexion	17	17
	Extension	3	3

D) Lower limb

Lower Limb		Number of patients	Percentage
Hip (7)	Adduction Contracture	3	3
	Flexion Contracture	4	4
Knee (7)	Flexion	7	7
Ankle (18)	Dorsi Flexion	16	88.8
	Planter Flexion	2	11.11

E) Perineum

Perineum	Number of patients	Percentage
Perineum Contracture	2	2
▪ With skin web	1	1
▪ Without skin web	1	1
Groin Contracture	3	3

Table 7: Post-burn problems

	Functional		Aesthetic		Psychiatric		Social	
	No.	%	No.	%	No.	%	No.	%
Male	44	44	30	30	22	22	24	24
Female	40	40	46	46	34	34	30	30
Total	84	84	76	76	66	66	54	54

Isolated functional problems are more common in males (84%).

Isolated Aesthetic problems are more common in females (76%).

Isolated burn problems (functional, Aesthetic, Psychiatric, Social) are less common as compared to a combination of (functional + Aesthetic + Psychiatric + Social).

- Isolated burn problems

	Aesthetic + Functional	Aesthetic + Functional + Psychiatric
Male	44	44
Female	40	47
Total	84	91

A combination of Aesthetic – functional + Psychiatric is more common in females while males had more common combination problems including functional aesthetic + social.

Discussion

Burn injuries not just damage the body physically but it has devastating effects on the person's psyche and emotions. Extensive burn injuries can leave a person emotionally scarred and psychologically crippled for life. The majority of these burn injuries are avoidable. Simple precautions are enough to avoid burn accidents which otherwise could render life into a crucible of pain and torment.

Extensive burn injuries not only affect the victim but also inflicts emotional pain upon the family members who have are the major caregivers of the patient once he or she is discharged from the hospital. In today's world where everyone wants to look glamorous and blemish-free, it can be very difficult to move in society with a disfigured face or body part, especially when everybody stares at These post-burn patients or treats them differently. Social awkwardness becomes a problem with such patients especially in the pediatric age group as children tend to make fun and stare and point fingers at kids who have any form of disfigurement. Burn victims tend to get ostracised from the community and are treated differently from normal individuals. This not only hampers the well-being of the patient but also the socio-economic growth of the country as these citizens will remain unemployed and not contribute to the development of the country [2-6].

Age, sex, and socioeconomic distribution

In our series of 100 patients, it was found that the most commonly affected age group in between 15-30 years 44 cases (44%) followed by 1-14 years 23 cases (23%), 31-45 years 19 cases (19%) 46-60 years 8 (8%), >61 years 4 (4%), up to 12 months 2 cases 2%. Results of the present study were comparable with the results of the study of Prena Malik et al and Soumanta chaktraborty et al, contrary to the present study, Faiza Shahid et al study in which post-burn problems is more common in the pediatric/ younger age group [6-9].

In the present series of 100 patients, it was found that females are more commonly affected then, Males. 61 Female cases (61%) and 39 Male cases (39%). In the present series of 100 patients of post-burn problems, it was found that the Low Socio-economic group more common than the high socioeconomic group. Rural cases were 71 (71%) and Urban cases were 29(29%). Those cases which belong to Low socio-economic group total 71 cases Male were 18 (25%) and Female were 53 (74%) and High socio-economic group totals 29 cases Male were 8 (27%) and Females were 21 (72%). In the present series of 100 patients of post-burn problems, it was found that the most commonly affected group is Dependent (Elderly/ children) total cases – 38 (38%) (12/26) out of which children are more common and second most commonly affected group is Housewife 32 (32%). The present study results were consistent with the studies conducted by Fazia shahid et al, Prerna Malik et al, Sanijab Tripathee et al and Hala Ahmad et al [10-15].

In our series of 100 patients of post-burn problems most common cause of the burn is Thermal burn cases 84 (84%) and the second most common cause of the burn is Electrical burn cases 11 (11%) followed by chemical burn cases 5 (5%). Fazia shahid et and also in studies of Iqbal and Saaiq

(2011) out of 1725 cases of post-burn patients most common cause of the burn is Thermal burn 1452 (84.2%) and the second most common cause is Electric burn 143 (8.3%) followed by chemical burn 4 (0.2%).[12,13].

Psychiatric problems

In our series of 100 patients of post-burn problems. It was found that the most common psychiatric problems are Major depression cases 36 (36%) and the second most common cases are Night Mare 22 (22%) followed by PTSD cases 16 (16%) and around 31 (31%) cases had no any Psychiatric disorder. Manimaran Ramcharan et al out of 100 cases of post-burn problems most commonly affected group is Major depression cases are 45 (45%) and the second most common group affected are no Psychiatric disorder cases 35 (35%) followed by the third most common group is Substance Abuse cases 19 (19%). Prerna Malik et al and Asma Manzoor et al found out that patients most commonly affected were Depression cases 10 (33.33%) and the second commonly affected group is PTSD 8 (26.67%) followed by Substance Abuse cases 4 (13.33%) [15-18].

The prevalence of psychological co-morbidity in patients with burns in our sample was found to be 45%. Generalized anxiety disorder was the most common psychological disorder found comorbid in these patients. Generalized anxiety disorder and major depressive disorder were significantly seen more in patients with flame burns Males showed a significantly higher proportion of Major depressive disorder; while anxiety disorders were commonly seen in females.

Dalal et al did a study[17] stated that recovery began after discharge from the hospital when the patient started to re-integrate into the society. Mood disorder during hospitalization in a study by Madianos et al [17]. and 20% at 12 months follow-up. Face disfigurement was significantly associated with the presence of psychiatric illness, at least during the acute hospitalization. Psychological impairment was found to be 45.5%. Five years after burn injury, patients with disfigurement on the hands or face reported symptoms of depression as compared to those with no visible burns, according to a study on psychological adjustment [18].

American Psychiatric Association (2010), a study was done by APA, Short Mood and Feelings Questionnaire, which is a self-rating report measure of symptoms of depression where an exploratory, Cross-sectional, self-selected sample of 311 burn survivors was included, who were at least 3 years post-burn to determine the frequency and correlates of symptoms of depression, experienced by long-term burn survivors. The results showed that 20-30% of the sample reported clinically significant symptoms of depression. Due to the traumatic nature of the burn accident and the painful treatment in burn care psychopathological responses such as depression and post-traumatic stress disorder (PTSD), have been found in 13-23% and 13-45% of cases, respectively in burn patients. Pre-burn depression and female gender in combination with facial disfigurement were identified as the risk factors associated with post-burn depression [19].

Aesthetic problems: Crockett (1964), Marneros et al described that hypertrophic scar develops at any location; keloid scars commonly affect chest shoulder, and ear lobe regions, which are area under low skin tension. It has been argued that skin or wound tension is implicated in the formation and location of abnormal scars [14]. Ramkrishna et al (1974) reported a predisposition of blood group A+ in keloid formation.

Functional problems

Erdem Guven et al, in his series of 60 patients have been operated for upper extremity contractures: 17 patients for facial contractures, which included lower lip contracture, ectropion, and hypertrophic scars that distorted the anatomic location, and 6 patients for cervical contractures.

In a study by Nikunj Bhavesh Modi et al, Hypertrophy and contracture were the commonest late complications and occurred in 3 cases. Good to fair results were obtained in 19 patients. ahmina Buriro et al in their study of 76 patients of post-burn problems found that the most commonly affected group is Upper limb 36 cases (47.36%) and the second most common group is head and neck 14 cases (18.42%) followed by Lower limb 11 cases (14.47%). P Suresh Kumar et al also saw similar results, out of 40 patients of post-burn problems most commonly upper limb contracture is most common which is present in 35 cases 87.5%. followed by head and neck 16 (40%), breast 9 (22.5%) [18-22].

Durga Karki et al, L Ndiaye et al had similar results. Etiologies of acute burn were due to flames in 43 cases (64%), hot fluids in 18 cases (27%), by chemical fluids in 3 cases (4.5%). In 3 other cases,

The patient couldn't precise the etiology because they didn't remember. It was noted that 15 cases (23%) of type 1 contracture, 7 cases (10%) of type 2, and 45 cases (67%) of type 3. The deficit of abduction varied between 30° and 110°. Associated lesions were dominated by hypertrophic trunk scars in 30 cases (45%); and scar contractures of elbow, neck, and breast in 7 (10.4%), in 8 (12%) in 2 cases (3%), respectively [20-23].

Dr. Binita beck et al found that out of 40 patients 14 (35%)cases had bilateral breast involvement and 15 cases (15%) had right side breast involvement and 11 cases (27.5%) had left side breast involvement.

Similarly, El Otiefy M A E et al out of total 74 females only 54 had post-burn breast problems 32 cases had downward contracture (43%) followed by upward contracture with axillary fold 26 cases (35%) and Loss or Distortion of nipple and areola 16 cases (23%). Dr. S Ahemad Rafeeq Mareen et al and Jeffery f schneider et al along with Sakirov Babur et al had similar results like ours [12-18].

In the present studies, it was seen that the most commonly affected individual belongs to the second and third decades of life. Females were more common than males. The marital status of patients with post-burn problems was found to be 65%. The dependent (elderly/children) were found in the majority (38%) and the second most common group was housewives (32%).

The most common cause of burn was found to be thermal burn which represented 84%. While studying the distribution of psychiatric problems, it was found that out of 100 patients 36 patients were suffering from major.

The social problems were that patients were not accepted in jobs, 19 patients had a sense of guilt, 15 patients were considered as social outcasts, 9 of them were not accepted in families and the remaining 28 had other social problems and aesthetic problems. Functional problems were also a major concern in these patients.

Conclusion

Psychopathology and psychological problems are identified in a significant majority of burn patients. Objective characteristics of disfigurement appear to play a minor role, although other factors, such as proneness to shame, body image problems, and lack of self-esteem, may be of significance. Therefore, to conclude, burns are a major concern For society and pose many psychiatric, social aesthetic, and functional problems. The best approach is to avoid /prevent burns and when occurs, then it should be dealt with the utmost care and a holistic approach with proper concealing and rehabilitation is needed for these patients.

What does the study add to the existing knowledge

There are several risk factors for burn injuries such as:

- Extremes of age are seen to at a higher risk as they tend to be careless or uninhibited.
- Females are seen to be at a higher risk as they tend to spend long hours in the kitchen especially in villages where the standards of safety are below par.
- Lower socio-economic groups are at greater risk as the safety measures are low and the level of education regarding the prevention of burn injuries is low.
- Patients who suffer from epileptic disorders, peripheral neuropathies, cognitive and physical disabilities have a higher risk of getting burnt.

Based on these risk factors the burn injuries can be prevented by modifying risk factors.

- Females entering the kitchen should not wear loose-fitting clothes or clothes that can catch fire easily like synthetic and nylon sarees.
- The safety standards in the kitchen should be maintained by using safe stoves and gas cylinders with proper valves. The stove should be regularly serviced and tubes and pipes delivering gas should be checked at regular intervals. A kerosene stove should not be used. Cooking on the floor should be prevented.
- Children should be prevented from entering the kitchen. Proper adult supervision is required for children.
- Occupational hazards can be avoided by maintaining proper safety standards and having a regular practice of safety drills.

Author's contribution

Dr. Varun Singh Salam: Concept and data collection

Dr. Bhupesh Kushram: Statistical analysis and discussion.

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