



Clinical Study of Etiology, Evaluation and Management of Unfavorable Skin Scars and Its Economic Impact on the Individual Patient

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ABSTRACT

Background: In the industrialised world alone, 100 million patients experience scarring annually as a result of 25 million post-traumatic operations and 55 million elective procedures. NHS spends £8.3 billion annually on clinical care of skin scars.

Methods: The present study is a prospective cohort study on etiology, diagnosis and management of unfavorable scars and its economic impact among the individual patient.

1. To study the etiology of unfavorable scars based on wound, surgeon and pathological factors.
2. To evaluate the role of various investigation modalities in patients with unfavorable scars based on Vancouver scar scale (VSS), and Patient & observer scar assessment scale (POSAS).
3. To evaluate various management strategies in these patients based on factors such as feasibility of surgery, surgical correction by Z plasty or W plasty for scars.
4. To evaluate its economic impact on the individual

Results: The mean age of the patients were 26.67 ±13.82 years, and majority of our patients were student (47.53%) followed by housewife (29.63%). Majority of our patients (45.67%) have not lost their any working day during the course of their scar duration and its management. However, we observed that 30 patients (18.51%) have lost their job, amongst them 11 (18.51%) were belonged to lower socioeconomic status

Conclusions: It can be suggested that physicians need to identify different types of skin scars and treat them appropriately. Misdiagnosis and mismanagement of scars can be costly for both the patient and physician.

Keywords: scars, keloids, hypertrophic scar, economic impact.

I. INTRODUCTION:

In the industrialised world alone, 100 million patients experience scarring annually as a result of 25 million post-traumatic operations and

55 million elective procedures. ¹Excessive scarring can occur after any damage to the deep dermis, including burns, lacerations, abrasions, surgery, piercings, and vaccines, and is a result of physiological wound healing abnormalities. Fibrous tissue outgrowths known as keloids and hypertrophic scars (HTSs) are brought on by a stall in the natural healing of wounds. About 1700 B.C., in the ancient Egyptian text found in the **Smith Papyrus** records, keloids were first mentioned. ² The definition of hypertrophic scars and keloids that is now in use was given to us by **Peacock et al.** Treatment options range from conservative (intralesional steroid injections, surgery) to invasive (depending on the type of scar) (compression therapy, topical silicone gel, brachytherapy, photodynamic therapy).^{3,4,5} In the United Kingdom alone, more than 20 million people have skin scarring, and about a quarter of them say it has led to immediate mental and/or medical issues. Long-term physical or psychosocial disabilities are claimed by 14% of people. ⁶ NHS spends £8.3 billion annually on clinical care of skin scars. ⁷ It is even harder to estimate how many people are affected by scarring globally. In the developed world alone, over 4 million people experience symptomatic scarring that necessitates management each year. ⁸

The present study will be done to analyse the genesis, diagnosis, and management of unfavorable scars and its economic impact among the individual patients due to a lack of data regarding unfavorable scars in the Western UP.

II. METHODS:

The present study is a prospective cohort study on etiology, diagnosis and management of unfavorable scars and its economic impact among the individual patient.

1. To study the etiology of unfavorable scars based on wound, surgeon and pathological factors.



2. To evaluate the role of various investigation modalities in patients with unfavorable scars based on Vancouver scar scale (VSS), and Patient & observer scar assessment scale (POSAS).
3. To evaluate various management strategies in these patients based on factors such as feasibility of surgery, surgical correction by Z Plasty or W Plasty for scars.
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III. RESULT:

The purpose of this prospective cohort study was to evaluate the prevalence, severity, and associated costs of unpleasant scars among patients presenting to the outpatient clinic or being transferred from other clinics at our institution.

Scar assessment scales like the Visual Analog Scale for Scars (VASS) and the Patient-Owned Scar Assessment Scale (POSAS) are widely used around the world, as shown by a review conducted by **Bae SH et AL**, 2014. More than 70% of the studies the authors looked at used the POSAS, making it the most widely used assessment tool.⁹

Total number of participants in this prospective cohort study, 65 (or 40.12 percent) is between the ages of 22 and 31. Patients' median ages were Patients had a mean age of 26.67 13.82. Our results were consistent with those of **Brissett et al (2017)**¹⁰, **Murray and colleagues' (1994)**¹¹, **Kamin and colleagues (1964)**¹², and **Ketchum and colleagues (1974)**¹³. According to the authors, scars can appear at any age; however, they are most common in people between the ages of 10 and 30. (Figure no. 1)

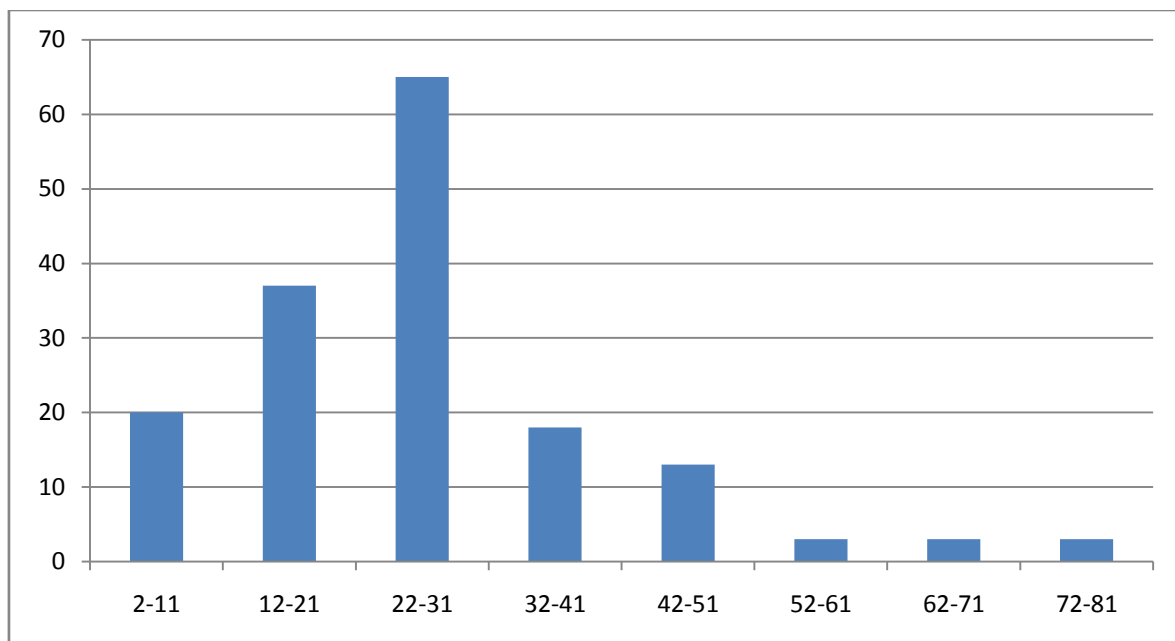


Figure 1. Age Distribution

With a male to female ratio of 1:0.73, 55 male patients (55% of the total) and 45 female patients (45% of the total) make up the current series.(figure no.2) **A. Brissett et al., 20019**; **J.**

Murray, 1994¹¹. Both **Kamin A. (1964)**¹²² and **Ketchum LD (1974)**¹²³ found a similar distribution of scars between sexes.

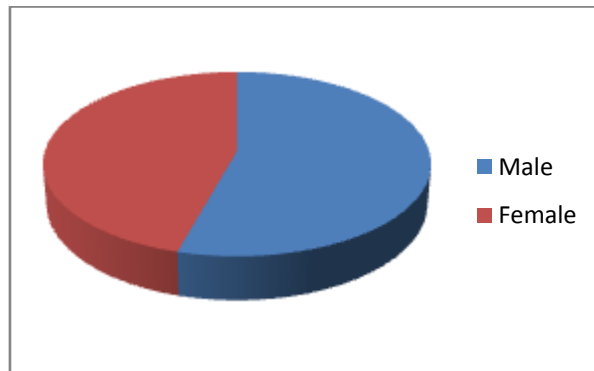


Figure no. 2 showing Gender distribution in scar patients

The majority of patients in this study (37.5%) had keloids as their primary scar type. Keloids are relatively uncommon in England. **Ramakrishna KM et al.**, who have been treating keloids for 8 years, report seeing 1000 patients in south India. Skin color, genetic variation, and environmental factors may all contribute to the increased dispersion across the globe.¹⁴

Further, we found that 17.02% of people had contractures. Only ten appropriate studies met the criteria for inclusion in the recent review by **Oosterwijk et al.** In-patients with burns had a discharge prevalence of 38-54%, falling to 0% after one month.¹⁵

We found that 30.86 percent of our patients had post-burn scars, with traumatic scars making up the next highest percentage at 29.63 percent. Consistent with the findings of **A Goel and shiravastav P**; we found that external factors, such as burn injury and trauma, are a common aetiology for scar formation.¹⁶

We found that in the scar management process, 67.90% of patients had no hospital stays at all. Three patients (1.85%) in our study had hospital stays of 2 weeks to 1 month; one patient had contracture release, and the other 2 patients had SSG. Overall, Contracture release had maximum duration of stay in 31 (19.13%) patients ranging from 1 day to 1month.(figure no.3)

MANAGEMENT	Type of scar						Grand Total	%
	CONTRACTURE	HYPERTROPHIC SCAR	IMMATURE SCAR	KELOID	MATURE SCAR			
CONTRACTURE RELEASE	26				5	31	19.14 %	
INJ TRIAMCINOLONE				36	1	37	22.84 %	
KELOID EXCISION	1			18		19	11.73 %	
PAIN MANAGEMENT		4	9	6	6	25	15.43 %	
SCAR REVISION		9	15	2	15	41	25.31 %	
SSG	1		3		4	8	4.94%	
Z INCISION	1					1	0.62%	
Grand Total	29	13	27	61	31	162		

Figure no-3- Table showing Type of scar and its management.

Duration of stay ranged from 1 week to 2 weeks for 12 (7.41%) patients, 1 week to 7 days for 37 (22.84%), and 2 weeks to 1 month for 1 (1.85%) patient. **Kong w et 2021**¹⁷ reported that the average

length of stay in the hospital for various scar management techniques in China ranged from 8.99 ± 14.63 to 19.49 ± 30.59 days



Partial recovery and scarring were the most common issues, affecting 10.50% of patients each. Patients diagnosed with keloid (36 patients) had the highest prevalence of scars, followed by scars in general (19patients). Consequences of intralesional triamcinolone, including hypopigmentation, atrophy, telangiectasia, delayed wound healing, and scar widening in 63% of

patients, were reported by Marguire HC., Jr. in 1956¹³⁷ and Manuskiatti W. in 2002¹⁸.

We found that the mean Vancouver scar scale score before and after treatment with contracture release, intramuscular triamcinolone, keloid excision, scar revision, subcision, pain management, or a Z incision was significantly different for all scar types. (**p0.05**). (figure no.4)

Management	Type of scar	Mean vancouver scale baseline	Mean vancouver scale Follow up	Mean change	P value Paired T test
Contracture Release	contracture	10.03±1.67	5.42±1.57	4.6±1.61	0.002*
	Mature scar	10±1.08	4.6±0.48	5.4±0.8	0.003*
INJ TRIAMCINOLONE	Keloid	7.61±1.33	4.69±2.01	2.91±1.84	0.001*
	Mature Scar	8	6	2	-
Keloid Excision	Keloid	9.11±1.40	4.94±1.88	4.16±2.08	0.004*
	Contracture	10	5	5	-
Pain Management	Keloid	7±1.41	6.5±1.5	0.5±0.76	0.36
	Hypertropic scar	6.5±1.11	6.25±1.08	0.25±0.43	0.75
	Immature scar	6.13±1.35	4.46±1.25	1.66±1.34	0.002*
Scar Excision	Immature Scar	7.71±1.41	4.07±1.25	3.64±1.14	0.0045*
	Hypertropic scar	9.22±0.81	4.88±2.02	4.33±2	0.001*
	Keloid	9.5±0.5	5.5±2.5	4±2	0.004*
SSG	Mature Scar	7.85±1.88	5.28±0.88	2.57±1.38	0.001*
	Contracture	5	4	1	0.88
Z incision	Contracture	12	4	8	-

Figure no.4- table showing Type of Scar,its management and relationship between their pre and post operative assessment(Vancouver).

Pain management for Keloid and Hypertropic scars and SSG for contracture were not found to have a statistically significant difference between pre- and post-operative mean Observer scar scale scores. (**p>0.05**)

The vast majority of patients (47.53%) in our study reported spending between 1 and 5 thousand INR on scar management. Twenty-three percent of our patients spent more than 20,000 INR. To correct the contracture, we used the contracture release method, which accounted for 14.20% of the total cost

IV. CONCLUSION:

It can be concluded from our study that keloid and hypertropic scar were the most

commonly occurring types of scar. In our study majority of the patients have spent 1-5000 INR for their scar management. It can be suggested that physicians need to identify different types of skin scars and treat them appropriately. Misdiagnosis and mismanagement of scars can be costly for both the patient and physician.

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