

# African Americans Are at Increased Risk of Developing Chronic Pain and Itch at the Site of Tissue Autograft Following Major Thermal Burn Injury

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Trauma Recovery: Understanding Mechanisms  
& Promoting Healing



## INTRODUCTION

- Every year in the US, more than 50,000 individuals are hospitalized following major thermal burn injury (MThBI).<sup>1</sup>
- Many of these individuals require a tissue autograft (Figures 1a-c).
- Chronic pain<sup>2</sup> and itch<sup>3</sup> at the tissue autograft site are common, morbid outcomes and substantially affect burn survivor quality of life.
- The study of ethnic differences is important because it may provide novel insights into disease pathophysiology and because it may lead to interventions to address outcome disparities. Evidence from other settings suggests that African Americans (AA) experience worse pain outcomes than European Americans (EA).<sup>4</sup> However, to our knowledge, ethnic differences in pain and itch outcomes between AAs and EAs experiencing MThBI have not been evaluated.
- In this prospective observational pilot study, we compared pain and itch symptoms among AAs and EAs experiencing MThBI during 2 distinct burn wound healing intervals: the Inflammatory & Early Proliferative phases (0 – 3 weeks post-op) and the Late Proliferative & Maturation phases (3 weeks – 6 months post-op). We hypothesized that AAs would experience worse outcomes compared to EAs.

## METHODS

- EA and AA patients 18-59 years of age who were admitted to 1 of 4 burn centers (Figure 2) within 72 hours of thermal burn injury and received a tissue autograft were approached for study enrollment.
- Postoperative pain and itch at the graft site(s) were assessed daily during hospitalization, weekly post-discharge through study day 21, at 6 weeks, and then monthly through 6 months.
- At each assessment, pain and itch severity were evaluated on a 0-10 NRS. NRS scores  $\geq 4$  were defined as moderate or severe (mod/sev).
- Differences between EA and AA patients' postoperative pain and itch trajectories during each interval were evaluated using generalized linear mixed models adjusted for age and sex.
- Secondary analyses compared the percentage of AAs and EAs with mod/sev pain and mod/sev itch at each timepoint ( $\chi^2$  analyses).

Figures 1a-c. Preparation and placement of tissue autograft: (a) skin harvested from donor site; (b) meshing of donor skin; (c) burn injury after graft placement. (These example photographs are from medscape.com.)



Figure 2. TRYUMPH Burn Research Network



Table 1. Characteristics of study participants.

Characteristic	All n=77 n (%)	EA n=41 n (%)	AA n=36 n (%)
Age			
18-26	27 (35.1)	17 (41.5)	10 (27.8)
27-41	24 (31.2)	9 (22)	15 (41.6)
42-59	26 (33.8)	15 (36.6)	11 (30.6)
Sex			
Male	58 (75.3)	30 (73.2)	27 (77.8)
Female	19 (24.7)	11 (26.8)	8 (22.2)
Education			
8-11 years	9 (11.7)	4 (9.8)	5 (13.9)
12 years or completed high school	28 (36.4)	13 (31.7)	15 (41.7)
Post-high school training other than college	4 (5.2)	1 (2.4)	3 (8.3)
Some college	26 (33.8)	16 (39)	10 (27.8)
College/post-graduate degree	10 (13)	7 (17.1)	3 (8.6)
Annual Income (\$)			
0-19,999	10 (15.9)	3 (8.3)	7 (25.9)
20,000-39,999	20 (31.7)	11 (30.6)	9 (33.3)
40,000-59,999	16 (25.4)	9 (25)	7 (25.9)
60,000-79,999	10 (15.9)	6 (16.7)	4 (14.8)
>80,000	7 (11.1)	7 (19.5)	0 (0)

Figure 3. Percentage of European Americans and African Americans with moderate or severe pain ( $\geq 4$ , 0-10 NRS) at the graft site by timepoint.

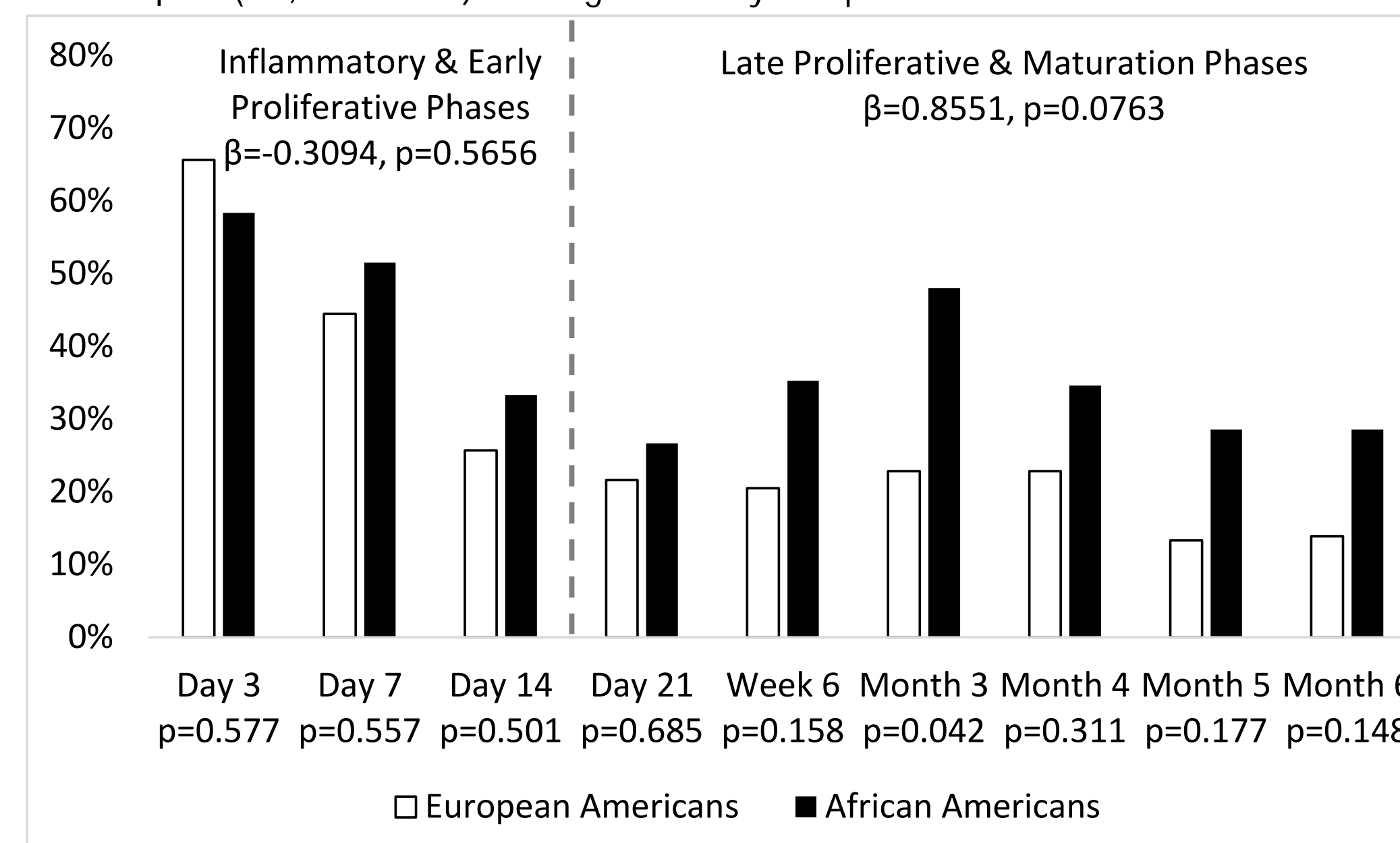
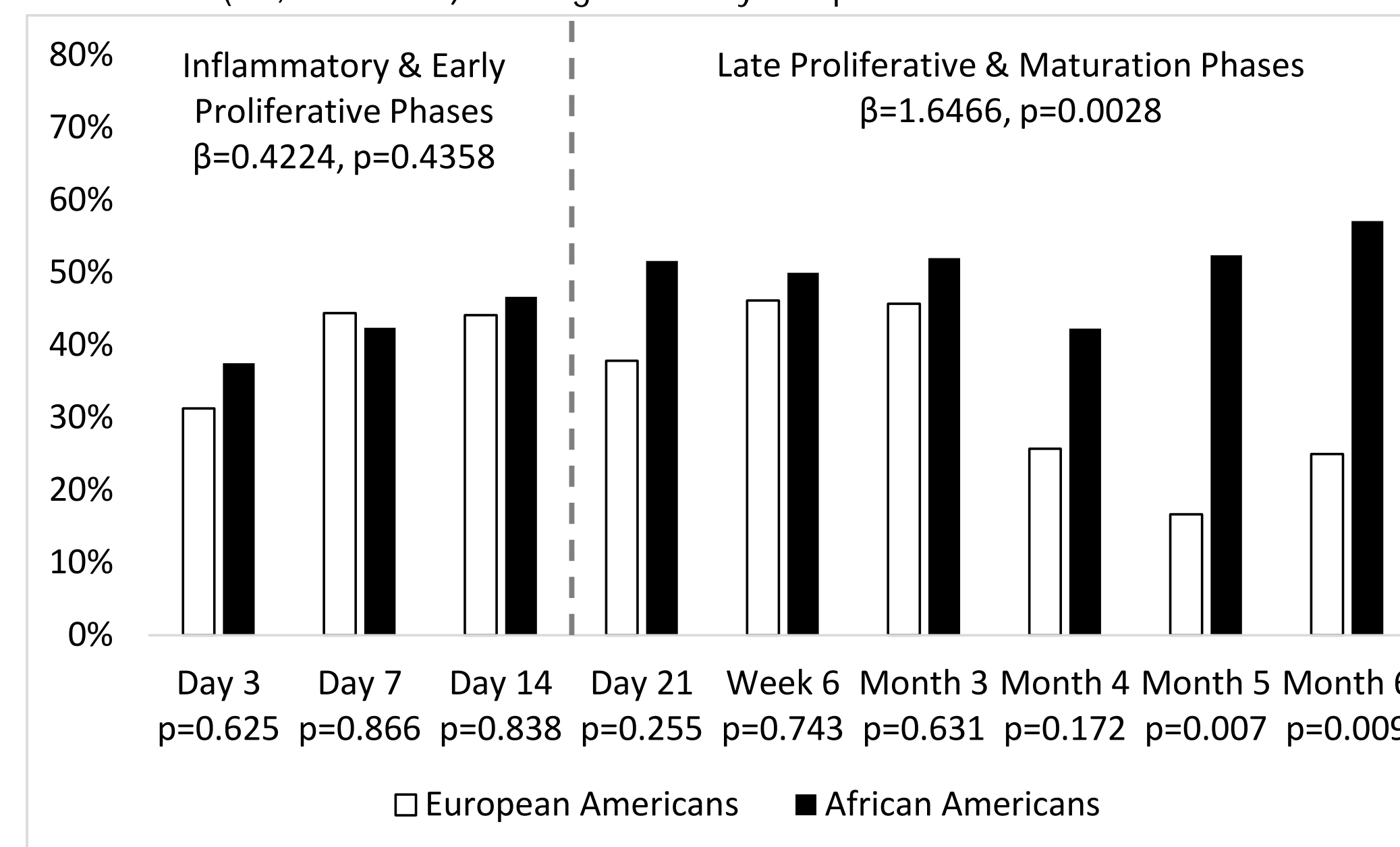


Figure 4. Percentage of European Americans and African Americans with moderate or severe itch ( $\geq 4$ , 0-10 NRS) at the graft site by timepoint.



## RESULTS

- 77/80 (96%) of participants completed assessments through Study Day 21 at the time of these analyses and were included.
- Participants' (41 EA, 36 AA) characteristics are shown in Table 1.
- During the Inflammatory & Early Proliferative phases of burn healing, graft pain (Figure 3) and itch (Figure 4) outcomes in EAs and AAs were similar.
- During the Late Proliferative & Maturation phases, clinically important and consistent differences were observed in the percentage of AAs and EAs experiencing moderate or severe pain (Figure 3) and itch (Figure 4).
- After adjusting for age and sex, differences in itch during the Late Proliferative & Maturation phases were statistically significant ( $p = 0.0028$ , Figure 4). Differences in pain were significant at the trend level ( $p = 0.0763$ , Figure 3).

## CONCLUSIONS

- These results suggest that African Americans experience more severe pain and itch at tissue autograft sites than European Americans following major thermal burn injury.
- Further studies are needed to evaluate the epidemiology and causes of differences in pain and itch outcomes between African Americans and European Americans.

## REFERENCES

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