

Diabetes Mellitus and its Effect on Lower Extremity Burn Recovery

INTRODUCTION

Diabetes is a growing problem in the United States with nearly 35 million Americans having the disease. These patients often present with complex health problems of the lower extremities including peripheral neuropathy and peripheral vascular disease. Because of these complications, diabetic patients are at an increased risk of foot injury, including burns with subsequent poor healing. We expect that poorly controlled diabetes mellitus, evidenced by an elevated A1c, will hinder healing and lead to increased complications. This study examines the effect that elevated A1c may have on burn recovery.

METHODS

The TriNetX Network, which provides medical records from 75 million patients from 57 healthcare organizations across the U.S. was searched for diabetic patients with foot or ankle burns. Patients were divided into three groups based on A1c levels: well controlled (<7%), moderately controlled (7-9%), and poorly controlled (>9%). Patients were propensity score matched by age, gender, ethnicity, and comorbidities. Outcomes including death, split-thickness skin grafting (STSG), and amputations were evaluated for each cohort.

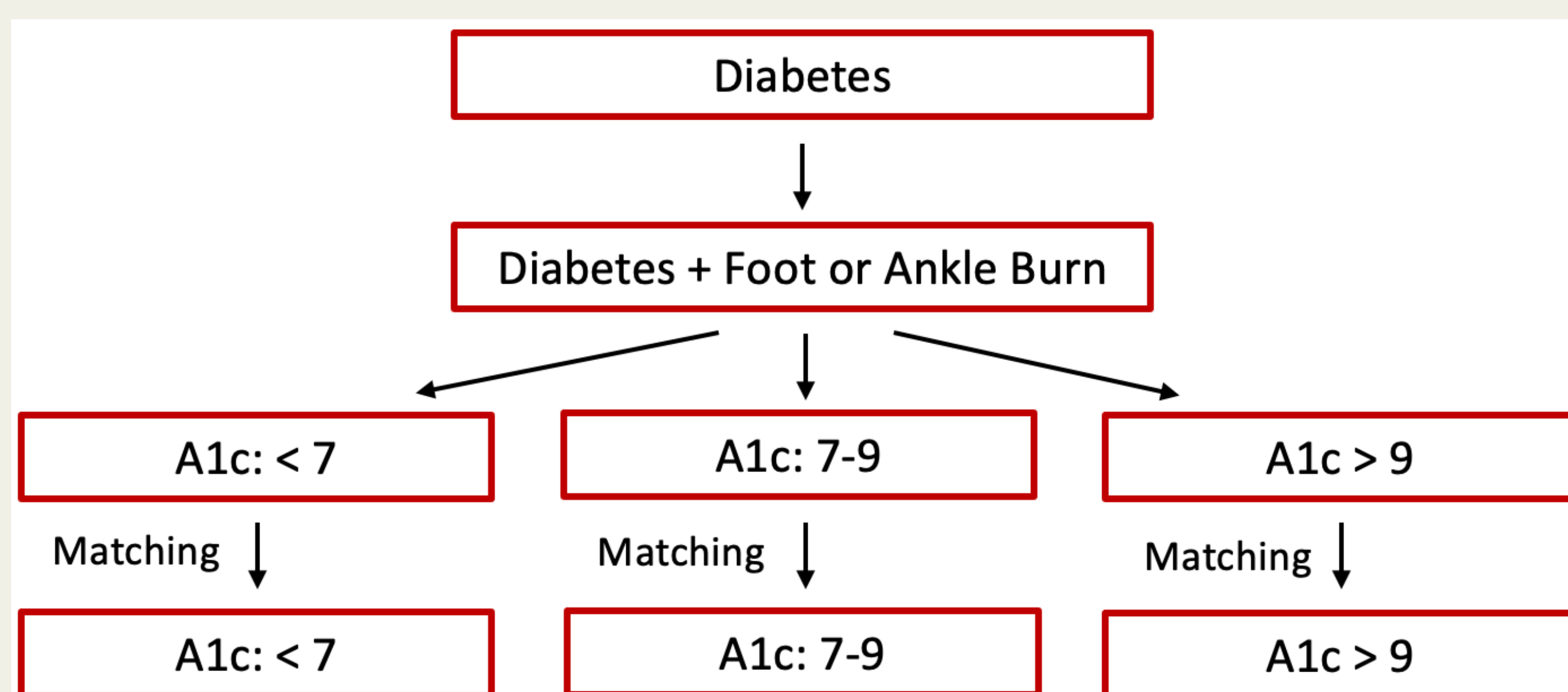


Figure 1: Stratification of Cohorts: Patients needed to have type 2 diabetes prior to having a foot or ankle burn in order to be considered. They were then divided into three cohorts based on A1c: Well Controlled (A1c: <7), Moderately Controlled (A1c: 7-9), and Poorly Controlled (A1c: >9). Once the cohorts were divided, patients were propensity score matched.

RESULTS

Well Controlled A1C vs Moderately Controlled A1C

	A1c: <7	A1c: 7-9	p-Value	Odds Ratio	Odds CI
Death	12.43%	12.74%	0.6656	0.972	(0.853,1.107)
STSG	3.65%	4.04%	0.3587	0.9	(0.719,1.127)
Amps (Foot and Toes)	4.30%	6.08%	0.0003	0.695	(0.57,0.847)
Infections	28.11%	29.09%	0.329	0.953	(0.866,1.035)

Figure 2: This figure shows outcomes between the well controlled A1c and moderately controlled A1c cohorts after propensity score matching. A p-value <0.05 was considered significant. Amps = Amputations

Moderately Controlled A1C vs Poorly Controlled A1C

	A1c: 7-9	A1c: >9	p-Value	Odds Ratio	Odds CI
Death	12.10%	12.50%	0.61	0.964	(0.835,1.111)
STSG	3.87%	4.78%	0.0518	0.795	(0.63,1.002)
Amps (Foot and Toes)	6.75%	8.30%	0.0143	0.8	(0.669,0.957)
Infections	30.66%	32.38%	0.1225	0.924	(0.835,1.022)

Figure 3: This figure shows outcomes between the moderately controlled A1c and poorly controlled A1c cohorts after propensity score matching. A p-value <0.05 was considered significant. Amps = Amputations

Well Controlled A1C vs Poorly Controlled A1C

	A1c: <7	A1c: >9	p-Value	Odds Ratio	Odds CI
Death	11.27%	12.21%	0.2285	0.913	(0.788,1.059)
STSG	3.70%	4.84%	0.0195	0.755	(0.595,0.956)
Amps (Foot and Toes)	4.87%	7.98%	<0.0001	0.59	(0.484,0.72)
Infections	28.99%	32.01%	0.0067	0.867	(0.782,0.961)

Figure 4: This figure shows outcomes between the well controlled A1c and poorly controlled A1c cohorts after propensity score matching. A p-value <0.05 was considered significant. Amps = Amputations

RESULTS

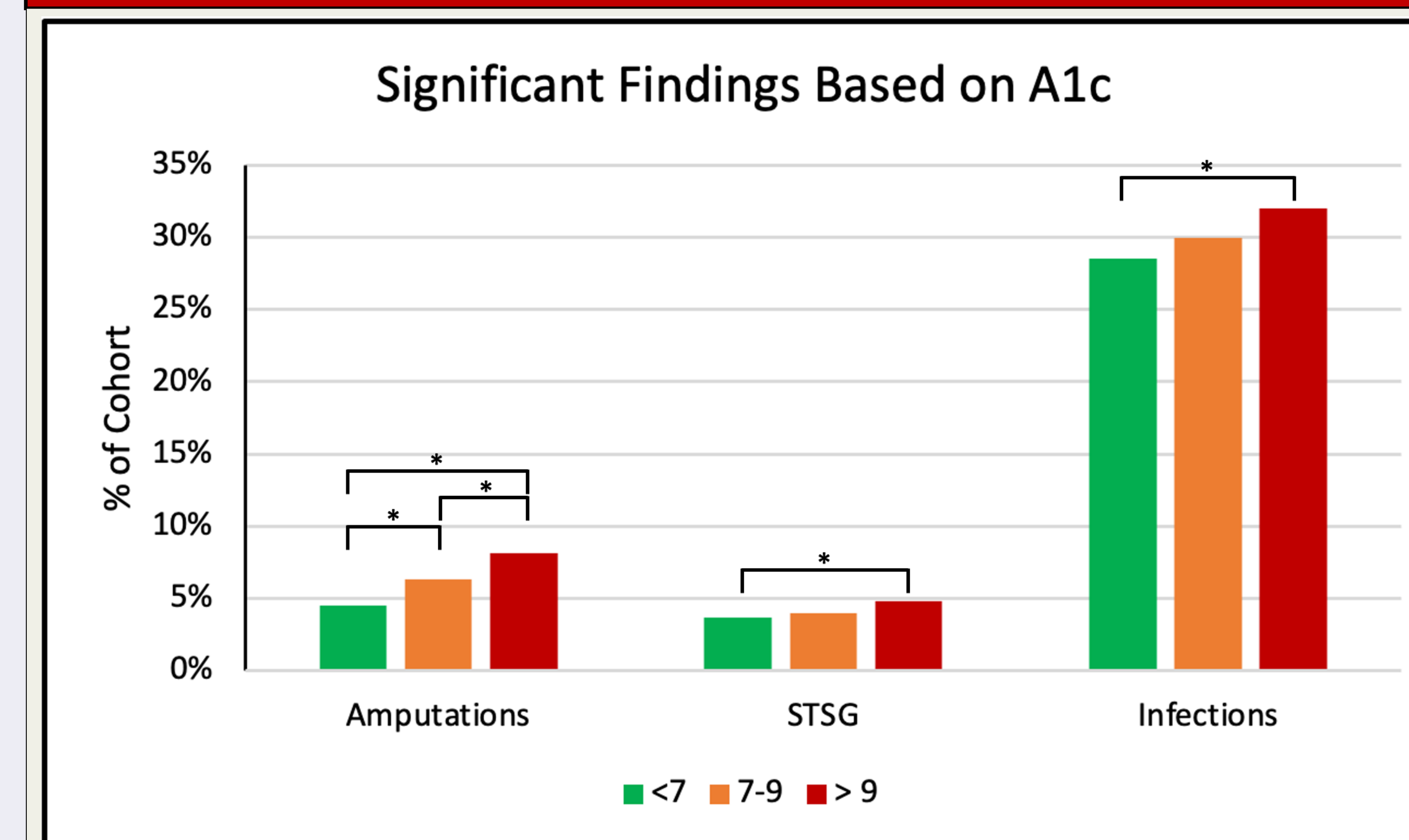


Figure 5: This figure shows the significant findings based on A1c level. * indicates a p-value <0.05 which was considered significant.

DISCUSSION/CONCLUSIONS

- Elevated A1c levels show a significant correlation with increased amputations, rates of STSG, and infection rates in diabetic patients with burns.
- Diabetic patients with poorly controlled diabetes who present with lower extremity burn injuries may require extra care in order to prevent further complications.

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