

# Modifiable risk factors playing a vital role in post-treatment period: a cerebral hemorrhage study

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## Introduction

Through previous studies it is well known that treating cerebral hematomas with prompt and accurate operative modality improves recovery and enhances post-event quality of life. Yet, little data is known as to what other pre-existing modifiable risk factors may affect post treatment outcomes.

## Objective

We sought to determine which modifiable risk factor had a significant impact on mortality in surgically treated cerebral hemorrhage patients.

## Methods

We retrospectively reviewed transferred and CT confirmed cerebral hemorrhage, subdural or epidural; patients to our tertiary care hospital for 8 months that were adjudicated by a neurosurgeon as a candidate for an operative procedure, either craniotomy or burr-hole surgery. We explored presence and absence of hypertension, diabetes mellitus, consumption of alcohol and smoking to determine whether either one had a significant effect on end point of survival of patient post-treatment.

Table 1: Baseline patient characteristics	
<b>Demographics</b>	
Age, Mean (SD)	Total N= 67 52(±21)
Female, N (%)	13 (19%)
<b>Presence of modifiable risk factors, N (%)</b>	
Diabetes mellitus	26 (38.8%)
Hypertension	32 (47.7%)
Tobacco Smoking	19 (28.3%)
Alcohol	32 (38.8%)
<b>Other clinical factors</b>	
Type of hemorrhage:	27 (40.3%)
Subdural	
Epidural	40 (59.7%)
Surgery:	51 (76.1%)
Craniotomy	
Burr-hole procedure	16 (23.8%)
Cause:	24 (35.8%)
Fall	
Motor vehicular accident	43 (64.2%)

Modifiable risk factor	Odds ratio	P-value	Class interval [L.L, U.L]
Diabetes mellitus	0.21	0.12	[0.03, 1.50]
Normal blood sugar	<b>5.85</b>	<b>0.04</b>	<b>[1.08, 31.66]</b>
Smoking	0.98	0.99	[0.10, 9.55]
No smoking	0.98	0.98	[0.17, 5.59]
Alcohol	1.95	0.54	[0.22, 16.65]
No alcohol	1.10	0.89	[0.25, 4.85]
Hypertension	0.53	0.51	[0.08, 3.57]
Normal blood pressure	3.81	0.11	[0.70, 20.44]

## Results

From our dataset, the mean age was 52±21 and 13 were females. Of the 67 patients reviewed, 47.76% (32) and 38.80% (26) suffered from hypertension and diabetes mellitus, type 2. Also, 28.35% (19) smoked tobacco and 47.76% (32) consumed alcohol. From the entire lot 35.8% (24) had a fall, that led to the hemorrhagic event, whereas 64.2% (43) were involved in a motor vehicular accident that led to the event. Craniotomy was performed on 76.1% (51), while 23.8% (16) received burr-hole procedure. We studied the effect of presence and absence of each modifiable risk factors, individually against survival for cerebral hemorrhage patients that received operative treatment using a binomial logistic regression model. 88% (59) of our studied patients survived 1 week post-surgery.

After studying the univariates from above, our statistical model revealed that having normal blood sugar levels [OR 5.8, CI 1.08-31.66, p=0.04] predicted a significantly better chance of survival after the cerebral hemorrhage event that was treated with a validated form of operative procedure.

## Conclusion

The trend for the most significant modifiable risk factor for survival after treatment for cerebral hemorrhage has been maintaining better blood sugar levels at our tertiary hospital center. Although absence of other studied risk factors does play vital role in improving survival, it was not statistically significant in our study and further in-depth study is needed to assess confounding effect of these contenders.

## TAKE HOME MESSAGE :



In post-surgical setting, it is advisable to keep a goal of maintaining normal blood sugar levels through strict dietary control and medications, as, from our study, it may have an impact in improving survival rates.



Also, from previous studies and data available, overweight, physical inactivity and obesity are notorious causes for increasing blood sugar levels, all medical personnel should keep a watchful eye on monitoring sugar levels in patients linked with the above-mentioned factors.



Educating friends and family about exercise, healthy eating habits and maintaining and overall healthy habits should be also prioritized as it would aid in improving quality of life in an unfortunate event involving surgery.