Cerebrospinal fluid purinomics as a biomarker approach to predict outcome after severe traumatic brain injury

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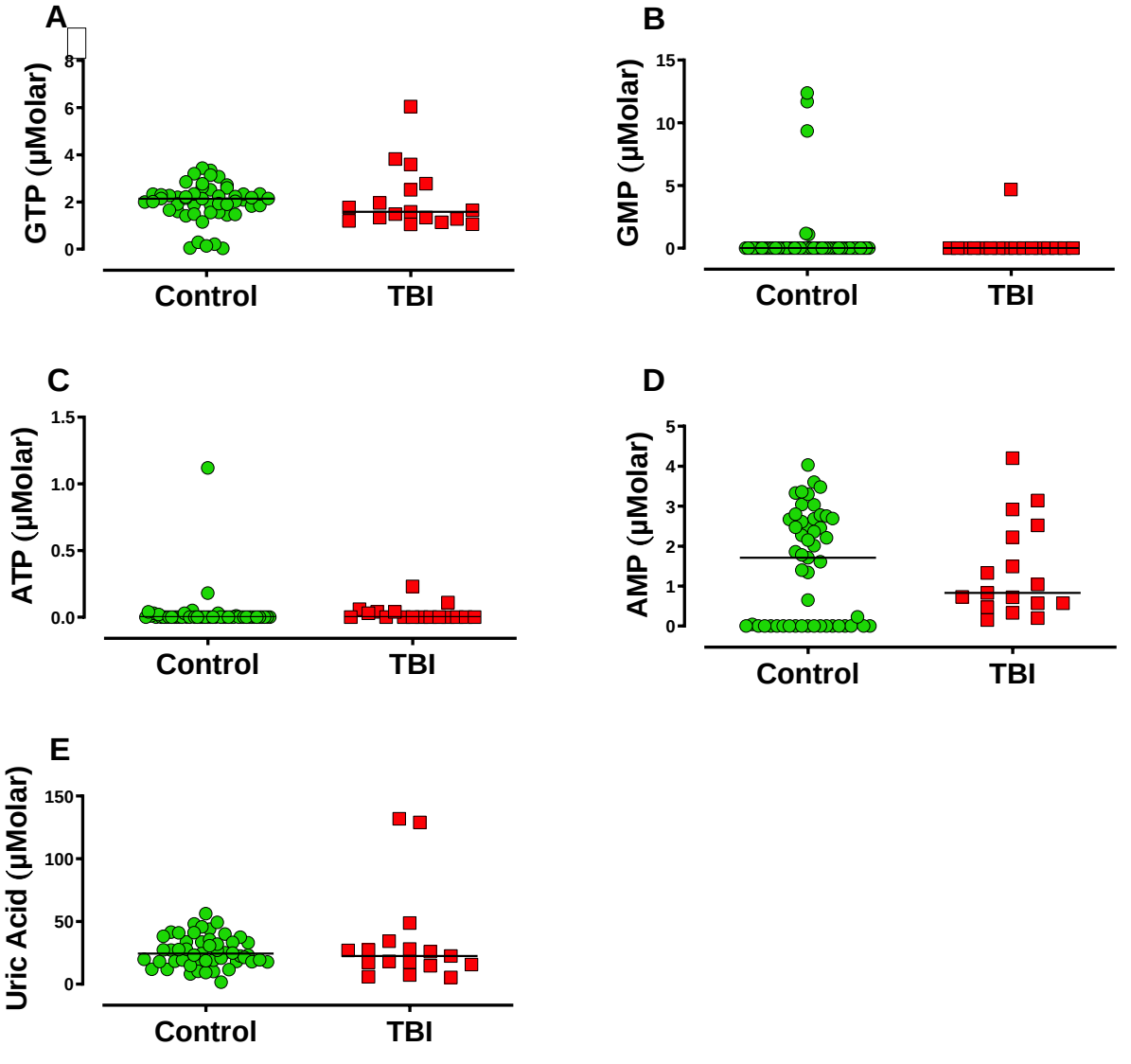
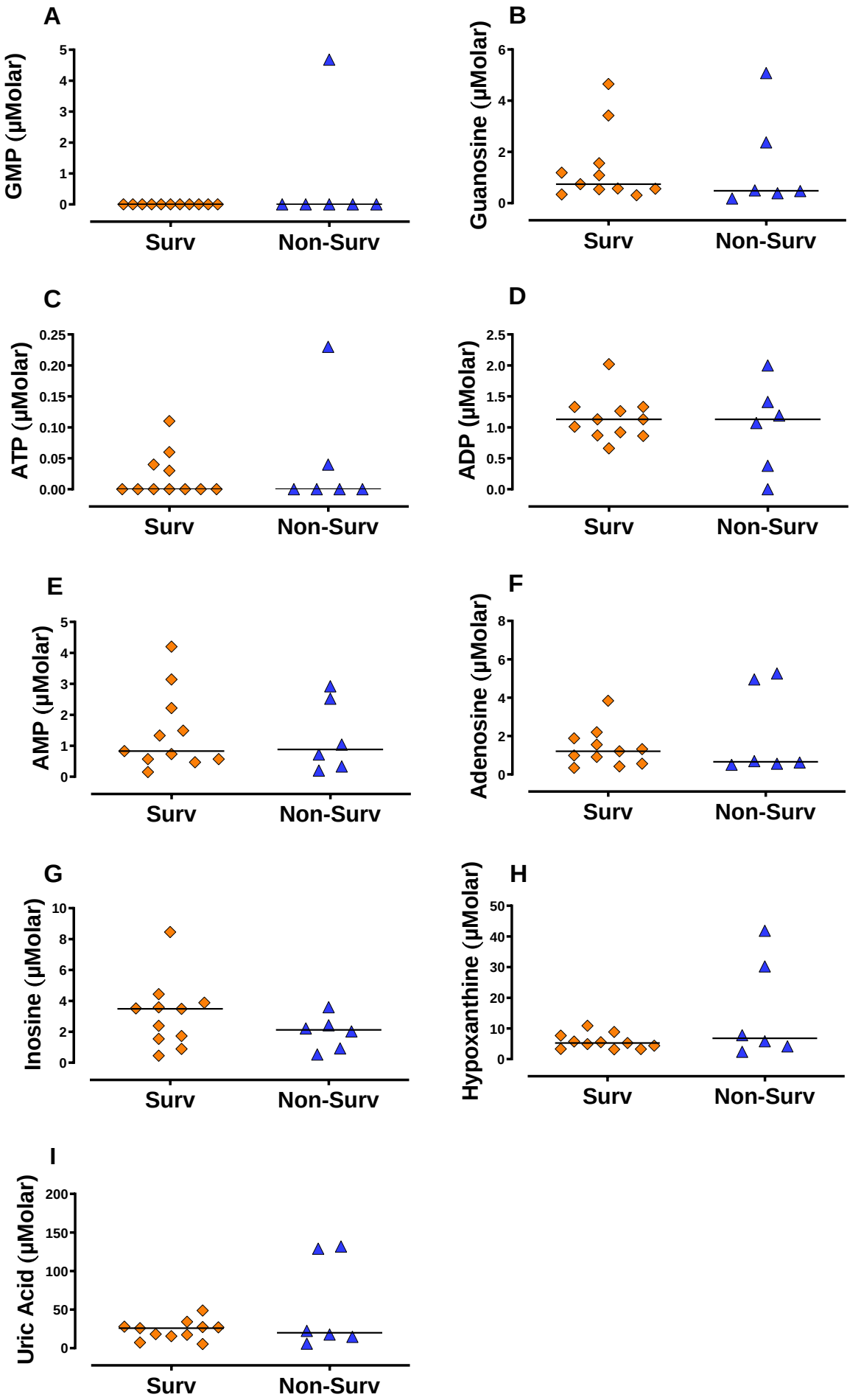
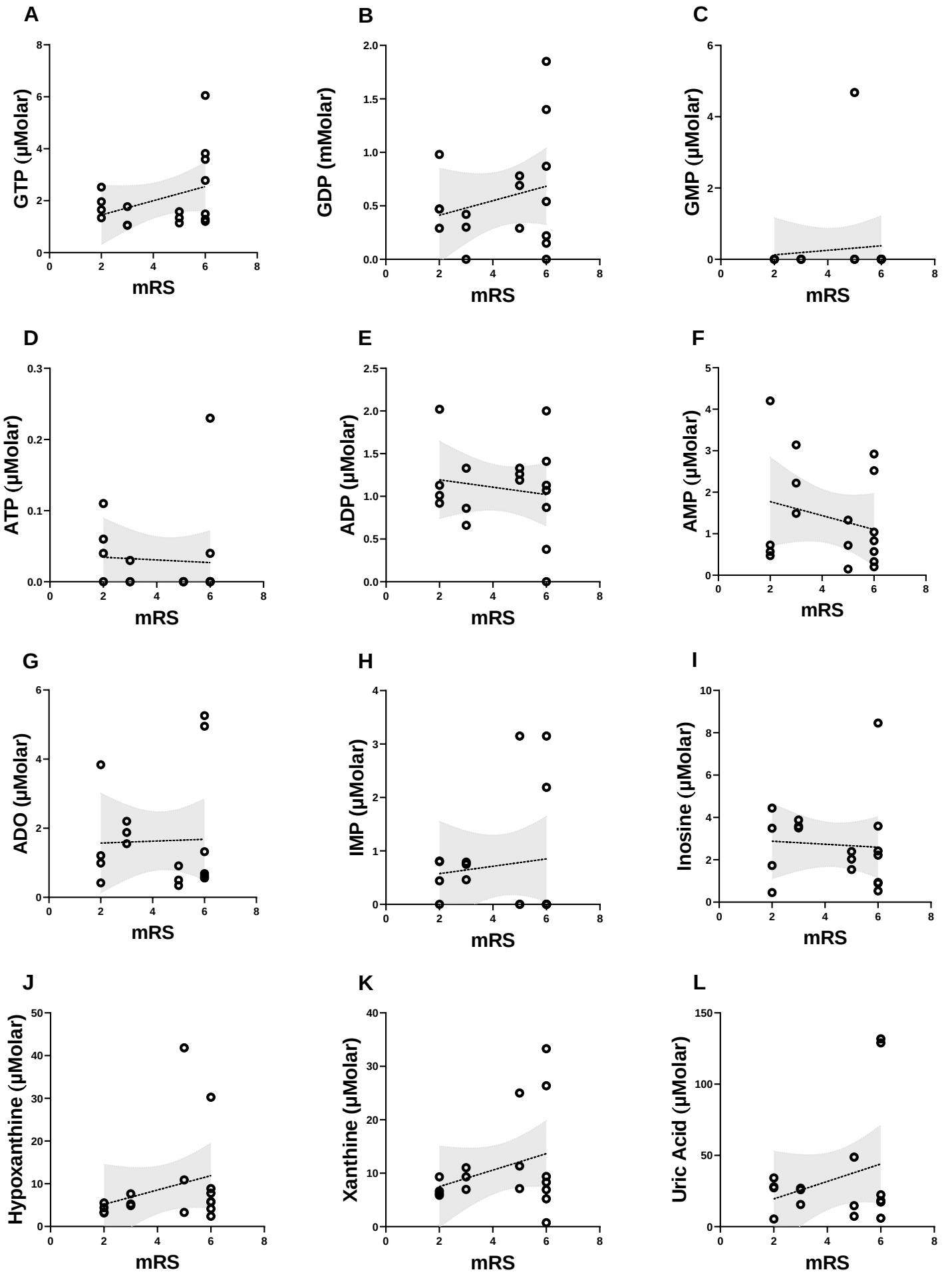
Supplemental files:


A
GTP (µMolar)
8
6
4
2
0
Control
TBI
B
GMP (µMolar)
15
10
5
0
Control
TBI
C
ATP (µMolar)
1.5
1.0
0.5
0.0
Control
TBI
D
AMP (µMolar)
5
4
3
2
1
0
Control
TBI
E
Uric Acid (µMolar)
150
100
50
0
Control
TBI

Supplemental Figure 1. Composite of purines in the CSF ofTBI patients relative to controls (surviving and non-surviving). This setting displays the remaining purines that did not show a statistically significant difference between TBI patients and controls. **(A)** GTP, **(B)** GMP, **(C)** ATP, **(D)** AMP, and **(E)** Uric Acid. Statistical significance was assessed through Mann-Whitney or Student's independent T-test (Controls n= 51 patients, TBI n = 17 patients).


A
GMP (µMolar)
5
4
3
2
1
0
Surv
Non-Surv
B
Guanosine (µMolar)
6
4
2
0
Surv
Non-Surv
C
ATP (µMolar)
0.25
0.20
0.15
0.10
0.05
0.00
Surv
Non-Surv
D
ADP (µMolar)
2.5
2.0
1.5
1.0
0.5
0.0
Surv
Non-Surv
E
AMP (µMolar)
5
4
3
2
1
0
Surv
Non-Surv
F
Adenosine (µMolar)
8
6
4
2
0
Surv
Non-Surv
G
Inosine (µMolar)
10
8
6
4
2
0
Surv
Non-Surv
H
Hypoxanthine (µMolar)
50
40
30
20
10
0
Surv
Non-Surv
I
Uric Acid (µMolar)
200
150
100
50
0
Surv
Non-Surv

Supplemental Figure 2. Composite of purines in the CSF of Non-surviving and surviving TBI patients. This setting displays the remaining purines that did not show a statistically significant difference in non-surviving and surviving TBI patients. **(A)** GMP, **(B)** Guanosine, **(C)** ATP, **(D)** ADP, **(E)** AMP, **(F)** Adenosine, **(G)** Inosine, **(H)** Hypoxanthine, and **(I)** Uric Acid. Statistical significance was assessed through Mann-Whitney or Student's independent T-test (Surv n =11 patients, Non-Surv n=6 patients).


A
GTP (µMolar)
mRS
B
GDP (mMolar)
mRS
C
GMP (µMolar)
mRS
D
ATP (µMolar)
mRS
E
ADP (µMolar)
mRS
F
AMP (µMolar)
mRS
G
ADO (µMolar)
mRS
H
IMP (µMolar)
mRS
I
Inosine (µMolar)
mRS
J
Hypoxanthine (µMolar)
mRS
K
Xanthine (µMolar)
mRS
L
Uric Acid (µMolar)
mRS

Supplementary Figure 3: Long term neurological outcome is not associated with CSF levels of most purines levels. This panel displays correlation plots between the modified Rankin Scale (mRS) and **(A)** GTP, **(B)** GDP, **(C)** GMP, **(D)** ATP, **(E)** ADP, **(F)** AMP, **(G)** Adenosine, **(H)** IMP, **(I)** Inosine, **(J)** Hypoxanthine, **(K)** Xanthine and **(L)** Uric acid; where none of the purines assessed displayed significant correlations (Spearman correlation, significance considered when $p<0.05$) with the two-year mRS of severe TBI patients (n = 17 TBI patients).

Patient	GTP	GDP	GMP	GUO	ATP	ADP	AMP	ADO	IMP	INO	HXN	XAN	UA
#3	3.67	1.48	2.53	4.16	0.17	1.58	6.9	1.9	0	33.07	15.13	12.47	10.54
#4	2.78	0.73	3.63	0.73	0	1.08	11.85	2.12	0	2.2	25.24	21.17	72.7
#7	1.95	1.41	0	0.63	0	1.33	1.41	1.02	0	23.68	20.35	14.49	61.28
#14	2.57	0.58	0	0.65	0.1	3.86	2.87	7.11	3.02	7.88	29.48	27.44	314.24

Supplementary Table 1. Purine profile of excluded patients. Table presents concentration of all purines (presented as µMolar) for each of the outlier patients.

	mRS	ICP	MAP	CP	GCS
mRS	1 (0)				
ICP	0.1733 (0.5060)	1 (0)			
MAP	-0.0928 (0.7233)	0.0071 (0.9794)	1 (0)		
CP	-0.3792 (0.1333)	-0.5117* (0.0358)	0.6962** (0.0019)	1 (0)	
GCS	-0.3520 (0.1660)	0.2134 (0.4108)	-0.5637* (0.0184)	-0.3887 (0.1231)	1 (0)

Supplemental table 2. Table of correlations between clinical parameters and the modified Rankin Scale (mRS). No association was observed between the mRS and Intracranial Pressure (ICP), Mean Arterial Pressure (MAP), Cerebral Perfusion, (CP), and Glasgow Coma Scale (GCS). Association between clinical parameters was limited to a negative correlation between mean arterial pressure with both cerebral perfusion and Glasgow Coma Scale. Positive correlation was observed between cerebral perfusion and mean arterial pressure. The table indicates values as Spearman r (p-value), with * indicating $p<0.05$, and ** $p<0.01$, respectively (N= 17 TBI patients).