STATISTICAL RESULTS

Table (8): Classification of Gestational Age (GA) for infants with Hypoxic Ischemic Encephalopathy

GA (weeks)	Frequency	Percent
38	10	33.3%
39	10	33.3%
40	9	30.0%
41	1	3.3%
Total	30	100%
Mean	39.03 wks	
Standard Deviation	± 0.89	
Coefficient of Variation (%)	2.28 %	

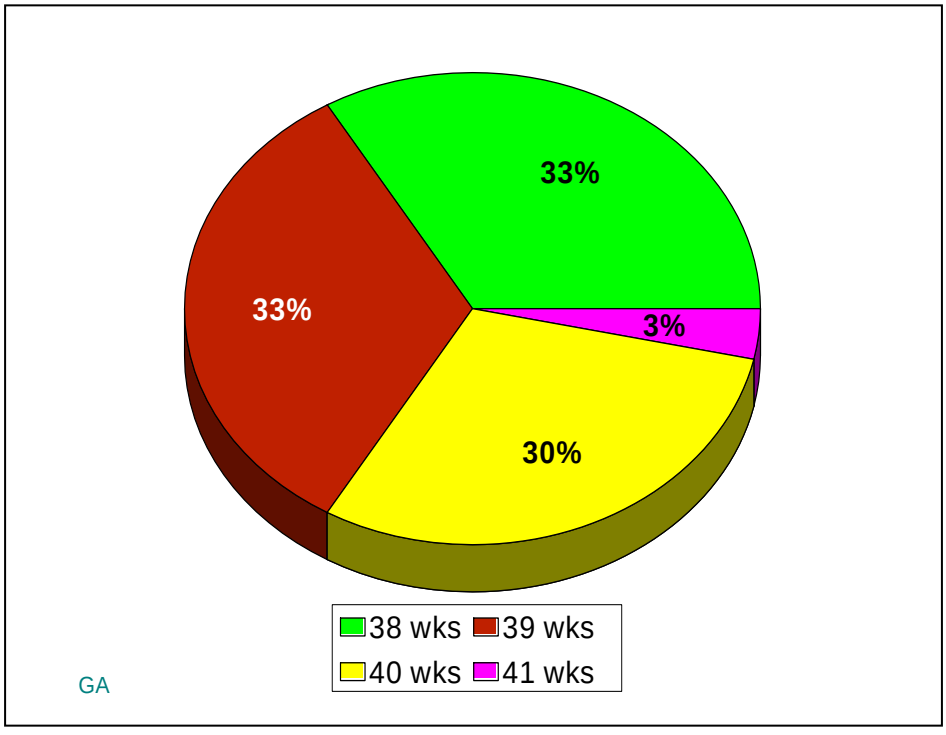


Figure (16): Classification of Gestational Age (GA) for infants with Hypoxic Ischemic Encephalopathy

Table (9): Classification of Gender for infants with Hypoxic Ischemic Encephalopathy

Gender	Frequency	Percent
Male	13	43.3%
Female	17	56.7%
Total	30	100%

Ratio Male : Female = 3 : 4

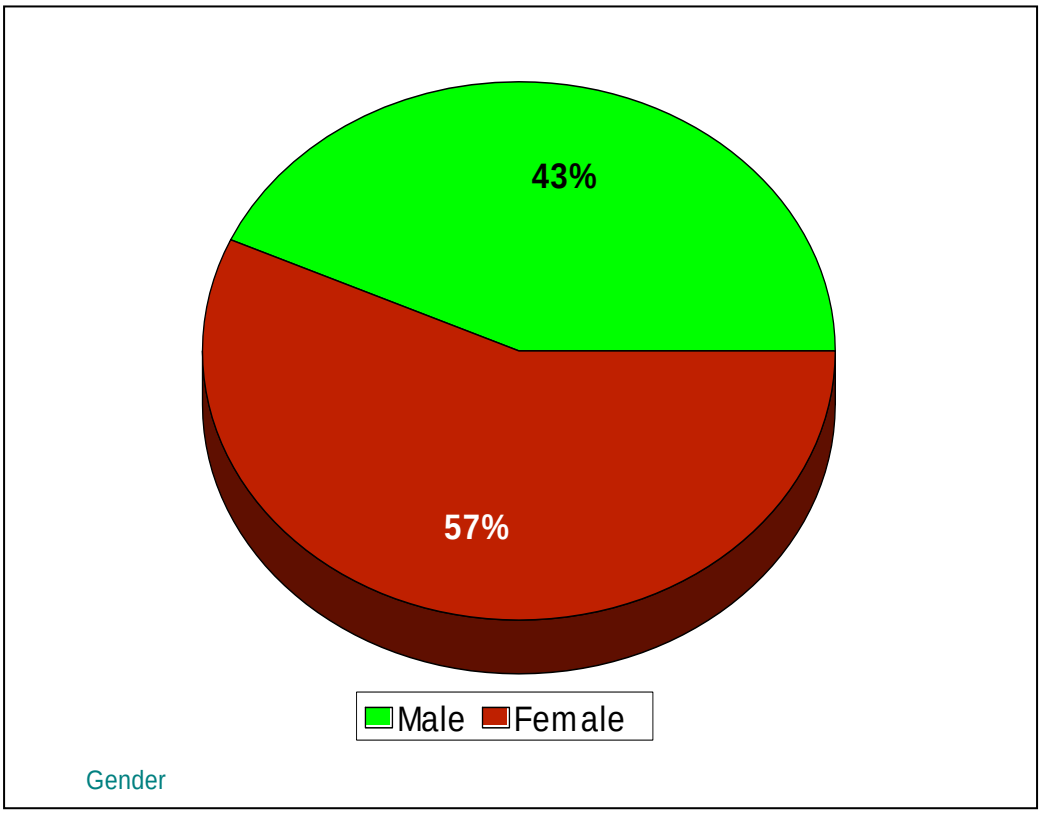


Figure (17) : Classification of Gender for infants with Hypoxic Ischemic Encephalopathy

Table (10): Classification of Mode of Delivery for infants with Hypoxic Ischemic Encephalopathy

Mode of Delivery	Frequency	Percent
NVD	28	93.3%
CS	2	6.7%
Total	30	100%

Ratio of NVD : CS = 14 : 1

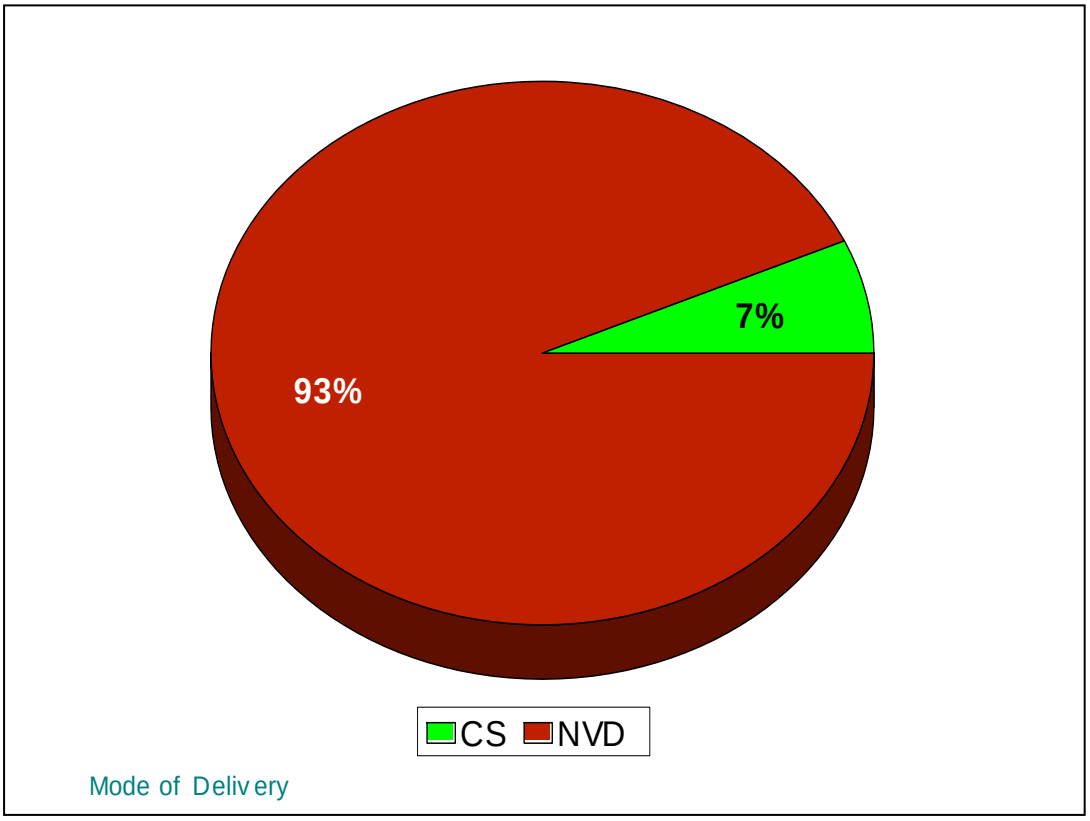


Figure (18) : Classification of Mode of Delivery for infants with Hypoxic Ischemic Encephalopathy

Table (11): Classification of Birth Weight for infants with Hypoxic Ischemic Encephalopathy

Weight (kg)	Frequency	Percent
< 2.5 kg	5	16.7%
2.5 kg or more	25	83.3%
Total	30	100%
Mean	2.82 kg	
SD	± 0.39	
CV (%)	13.71 %	

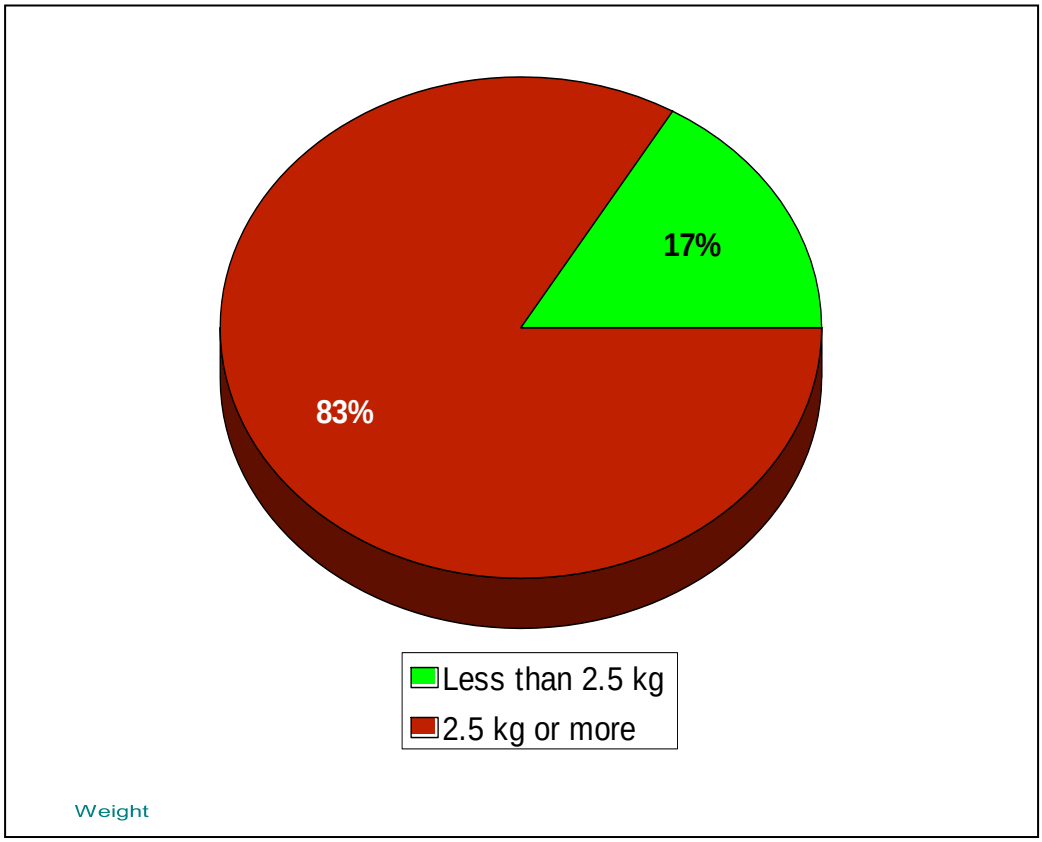


Figure (19) : Classification of Birth Weight for infants with Hypoxic Ischemic Encephalopathy

Table (12): Classification of Head Circumference for infants with Hypoxic Ischemic Encephalopathy

Head Circumference (cm)	Frequency	Percent
30	2	6.7%
31	1	3.3%
32	1	3.3%
33	2	6.7%
33.5	1	3.3%
34	6	20.0%
34.5	2	6.7%
35	9	30.0%
36	4	13.3%
36.5	1	3.3%
37	1	3.3%
Total	30	100%
Mean	34.27 cm	
SD	± 1.72	
CV (%)	5.02 %	

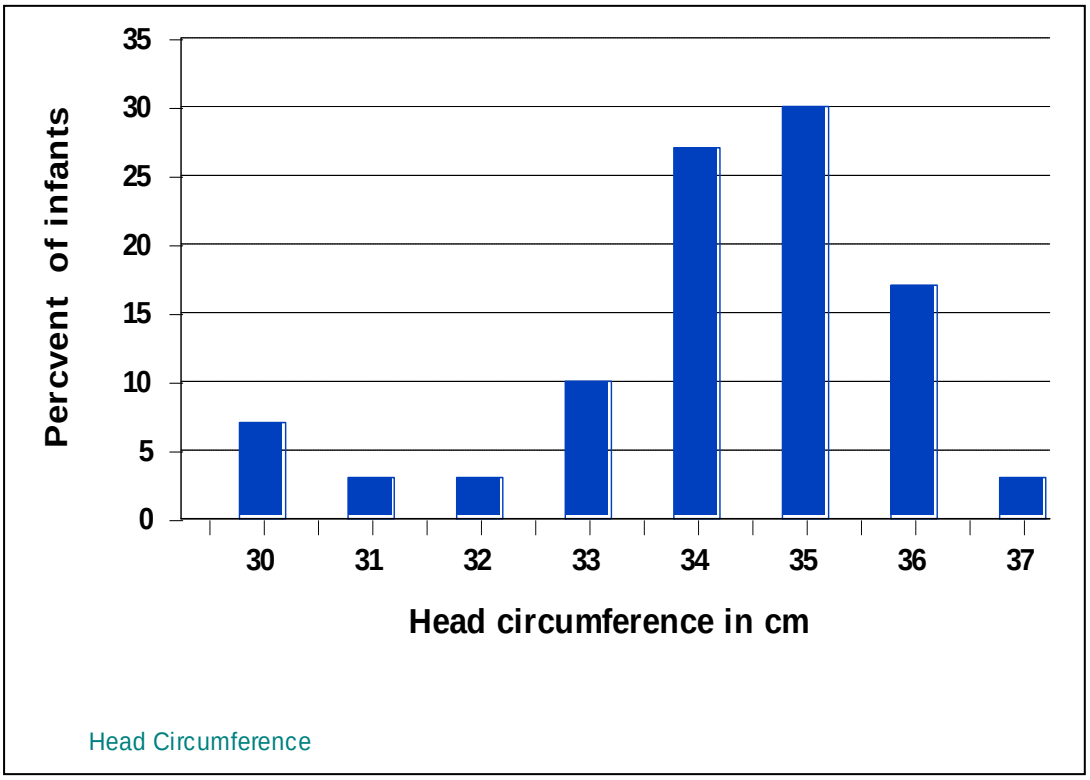


Figure (20) : Classification of Head Circumference for infants with Hypoxic Ischemic Encephalopathy

Table (13): Classification of Sarnat Staging for infants with Hypoxic Ischemic Encephalopathy

Sarnat Staging	Frequency	Percent
I Mild	15	50.0%
II Moderate	13	43.3%
III Severe	2	6.7%
Total	30	100%

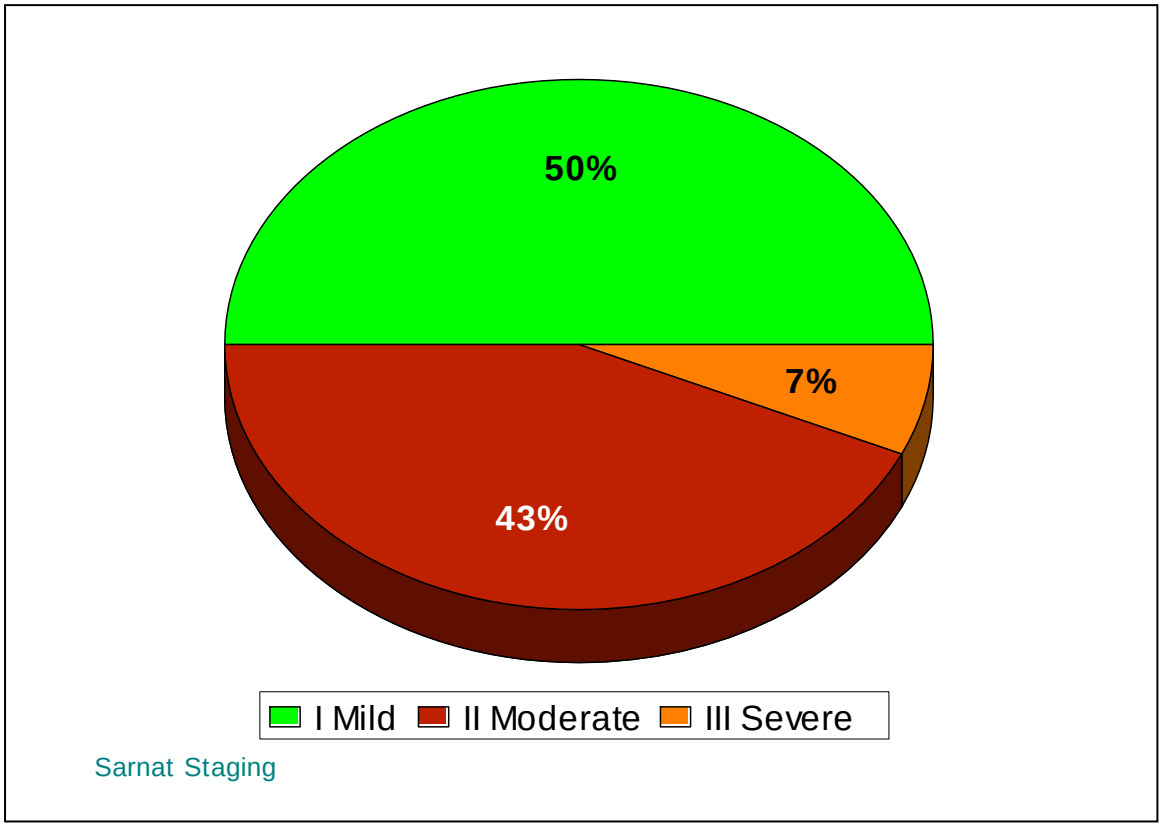


Figure (21) : Classification of Sarnat Staging for infants with Hypoxic Ischemic Encephalopathy

Table (14): Classification of Neo-neuro & up score for infants with Hypoxic Ischemic Encephalopathy

Neo-neuro & up score	Frequency	Percent
Normal	4	13.3%
Mild	13	43.3%
Moderate	7	23.3%
Severe	6	20.0%
Total	30	100%

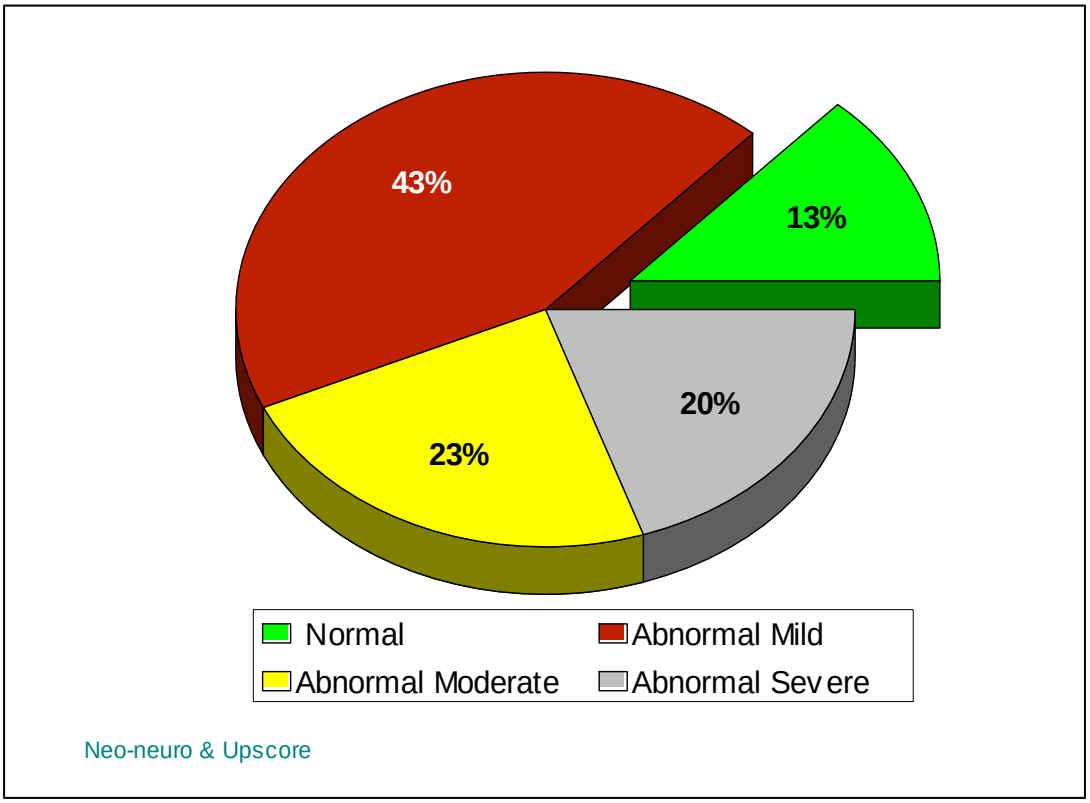


Figure (22) : Classification of Neo-neuro & up score for infants with Hypoxic Ischemic Encephalopathy

Table (15): Classification of Outcome for infants with Hypoxic Ischemic Encephalopathy

Outcome	Frequency	Percent
Living	23	76.7
Died	7	23.3
Total	30	100

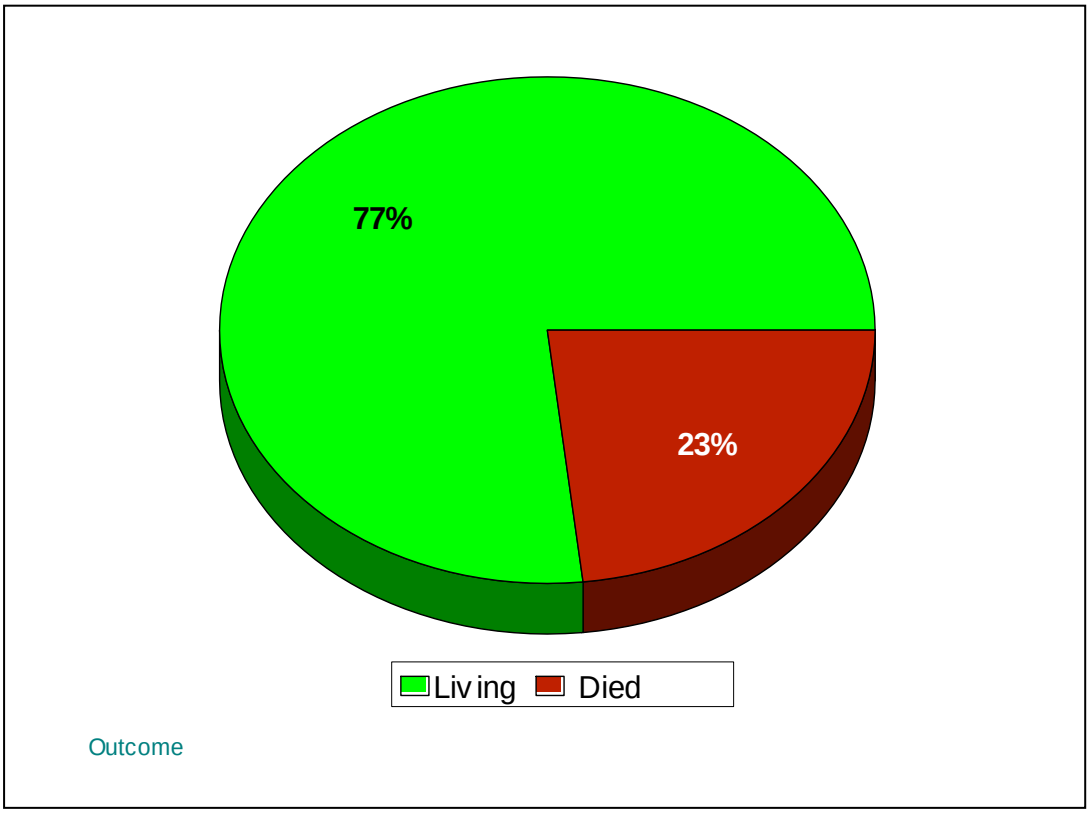


Figure (23) : Classification of Outcome for infants with Hypoxic Ischemic Encephalopathy

Table (16): Classification of Cranial Ultrasound Findings for infants with Hypoxic Ischemic Encephalopathy

Cranial Ultrasound Findings	Frequency	Percent
Normal	13	43.3%
Brain Oedema	8	26.7%
Periventricular Leukomalacia (P.V.L.)	3	10.0%
Brain Atrophy	2	6.7%
Sub Ependymal Hematoma	2	6.7%
Inter Ventricular hemorrhage (I.V.H)	2	6.7%
Total	30	100%

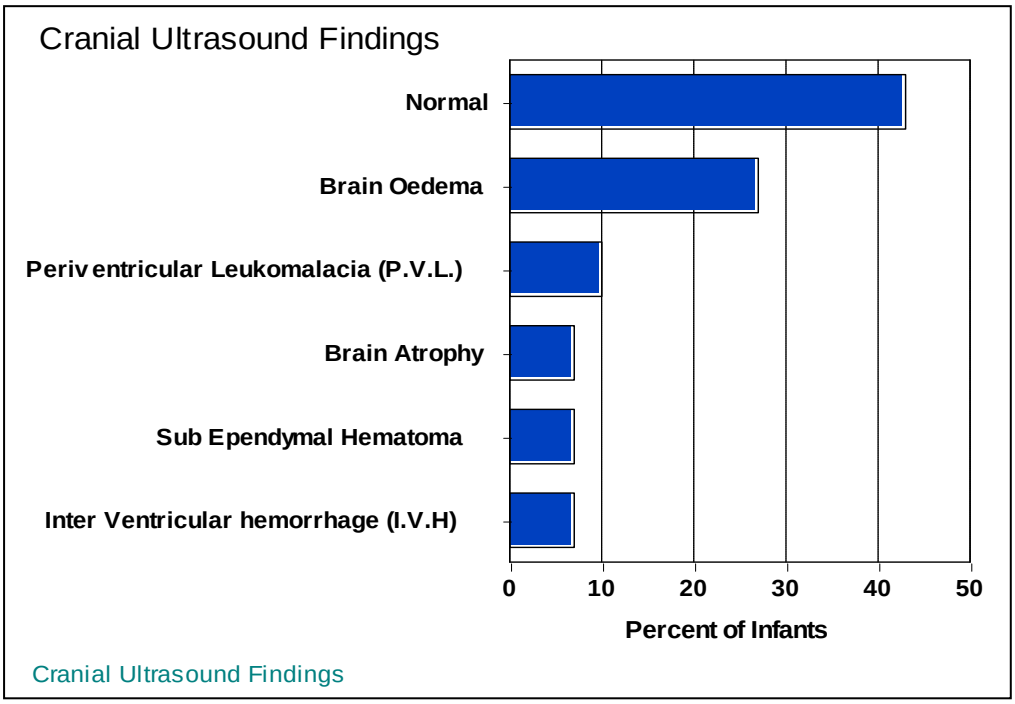


Figure (24) : Classification of Cranial Ultrasound Findings for infants with Hypoxic Ischemic Encephalopathy

Table (17): Follow up Cranial Ultrasound Findings

Follow up Cranial Ultra Sound Findings	Frequency
Normal then → Brain oedema	**1**
Brain oedema then →Normal	**1**
Brain oedema then →cerebral atrophy & mild ventriculomegaly	**1**
Intra-ventricular hemorrhage for follow up then →normal	**1**
Sub ependymal hematoma then →resolved	**1**

Table (18): Classification of PROM for infants with Hypoxic Ischemic Encephalopathy

PROM	Frequency	Percent
Yes	5	16.7%
No	25	83.3%
Total	30	100%

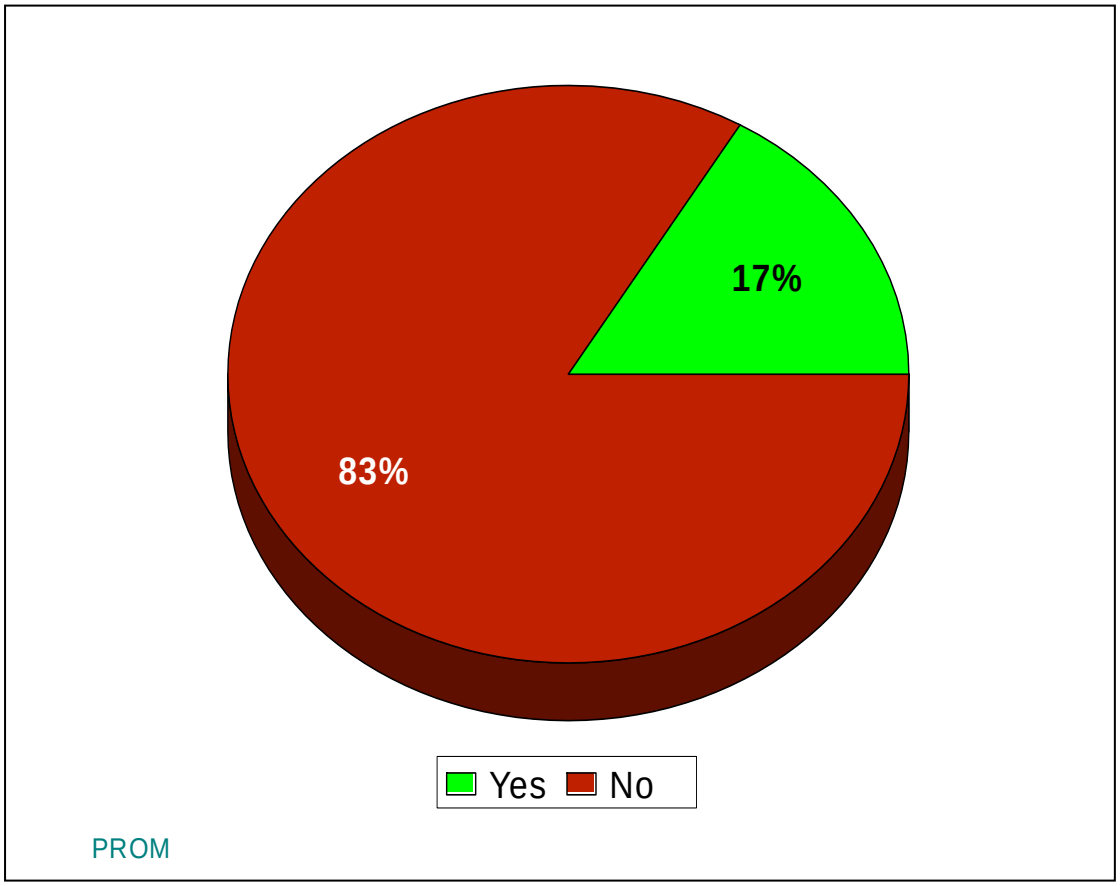


Figure (25) : Classification of PROM for infants with Hypoxic Ischemic Encephalopathy

Table (19): Classification of Sepsis for infants with Hypoxic Ischemic Encephalopathy

Sepsis	Frequency	Percent
Yes	11	36.7
No	19	63.3
Total	30	100

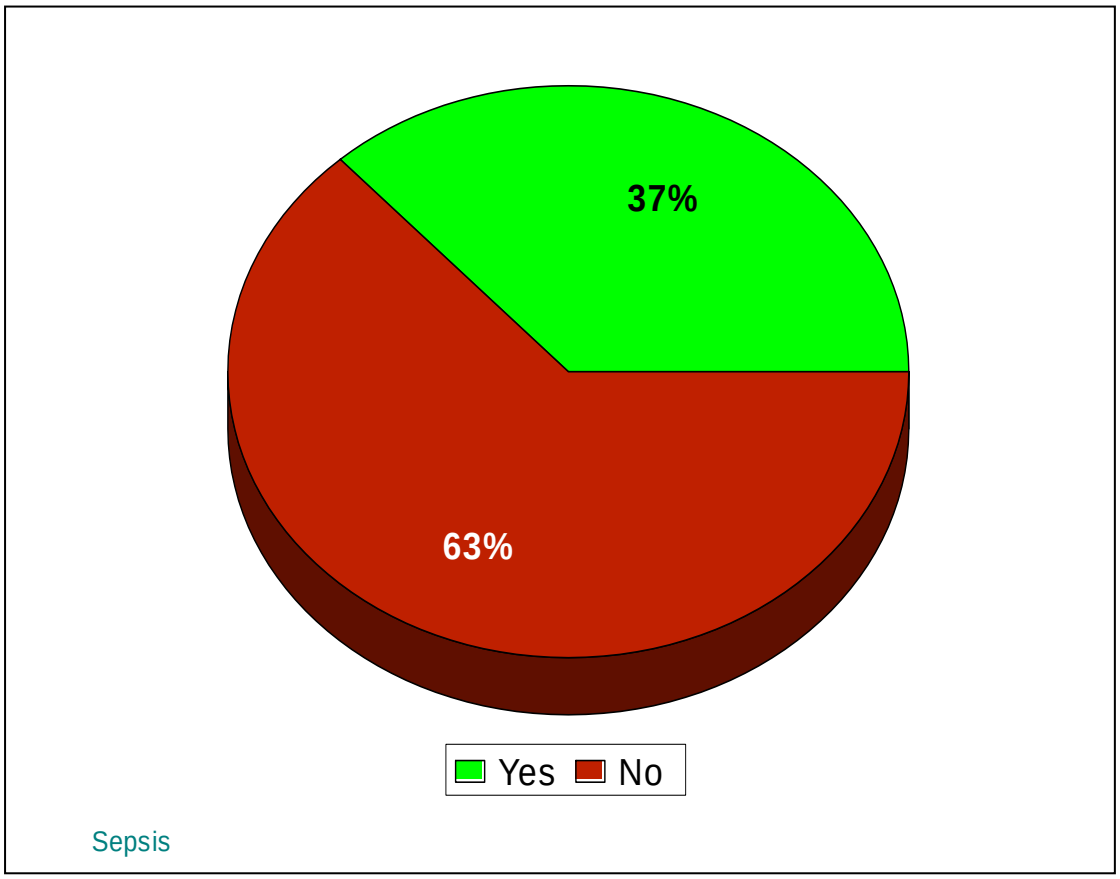


Figure (26): Classification of sepsis for infants with Hypoxic Ischemic Encephalopathy

Table (20): Classification of Diagnosis at Admission for infants with Hypoxic Ischemic Encephalopathy

Diagnosis at admission	Frequency	Percent
HIE	18	45.0%
Convulsions	8	20.0%
RD	4	10.0%
Congenital anomalies	3	7.5%
Neonatal Jaundice	3	7.5%
Massive IVH	1	2.5%
Sepsis	1	2.5%
Neuromuscular disorder	1	2.5%
Difficulty of breathing	1	2.5%
Total *(including multiple diagnosis)*	40	100%

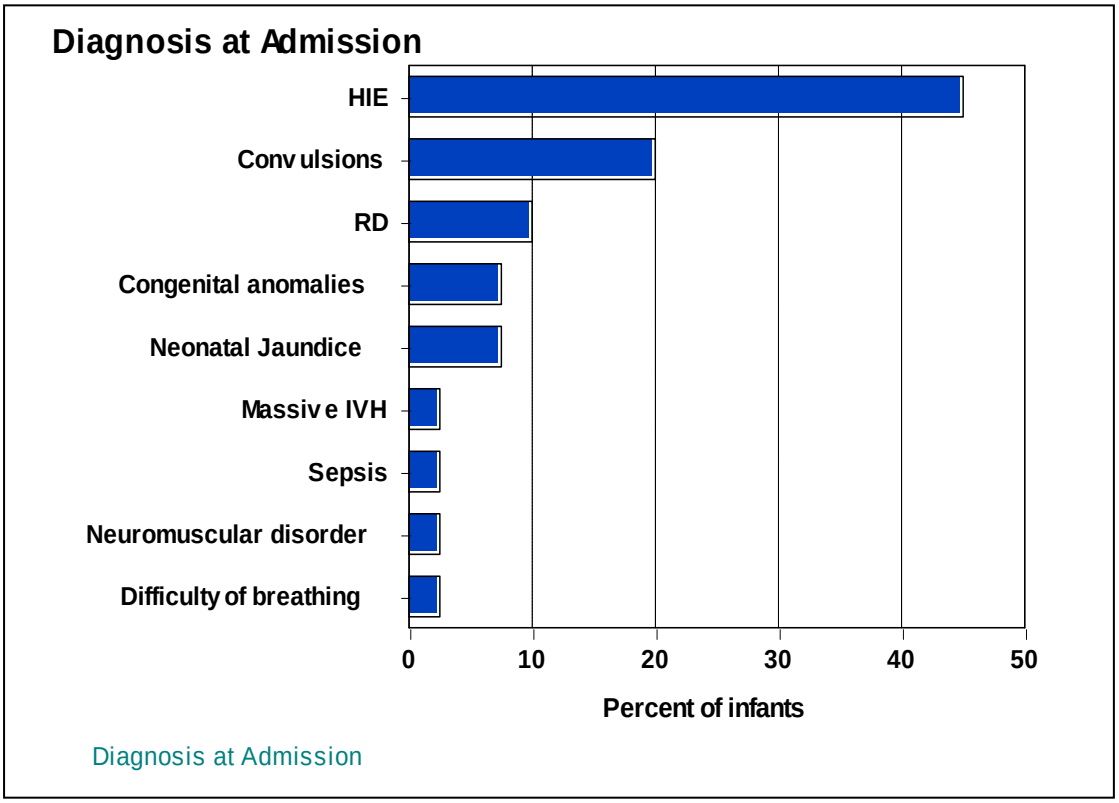


Figure (27) : Classification of Diagnosis at Admission for infants with Hypoxic Ischemic Encephalopathy

Table (21): Relationship between Gestational Age and Neo-Neuro & Up Score (NNUS)

GA (wks)	Abnormal NNUS severity				Normal NNUS	Grand Total
	Mild	Moderate	Severe	Total		
38	5 (56%)	3 (33%)	1 (11%)	9 (90%)	1 (10%)	10 (100)
39	3 (43%)	1 (14%)	3 (43%)	7 (70%)	3 (30%)	10 (100)
40	5 (56%)	3 (33%)	1 (11%)	9 (100%)	0	9 (100)
41	0	0	1 (100%)	1 (100%)	0	1 (100)
Total (% of Grand Total)	13 (50%)	7 (27%)	6 (23%)	26 (87%)	4 (13%)	30 (100%)
Chi square				$\chi^2 = 66.6$ **		

** : Significant Chi Square χ^2 at 1% probability level ($p<0.01$) indicating the existence of highly significant differences between the percent distribution of Normal NNUS : Abnormal NNUS and Gestational age groups.

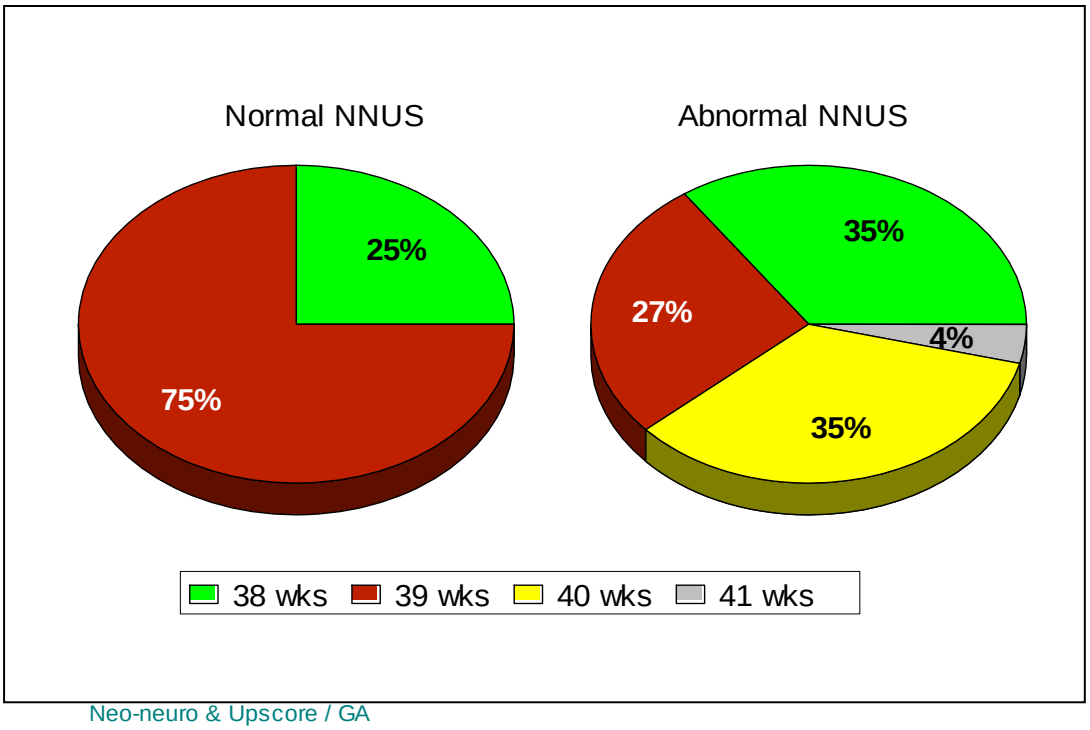
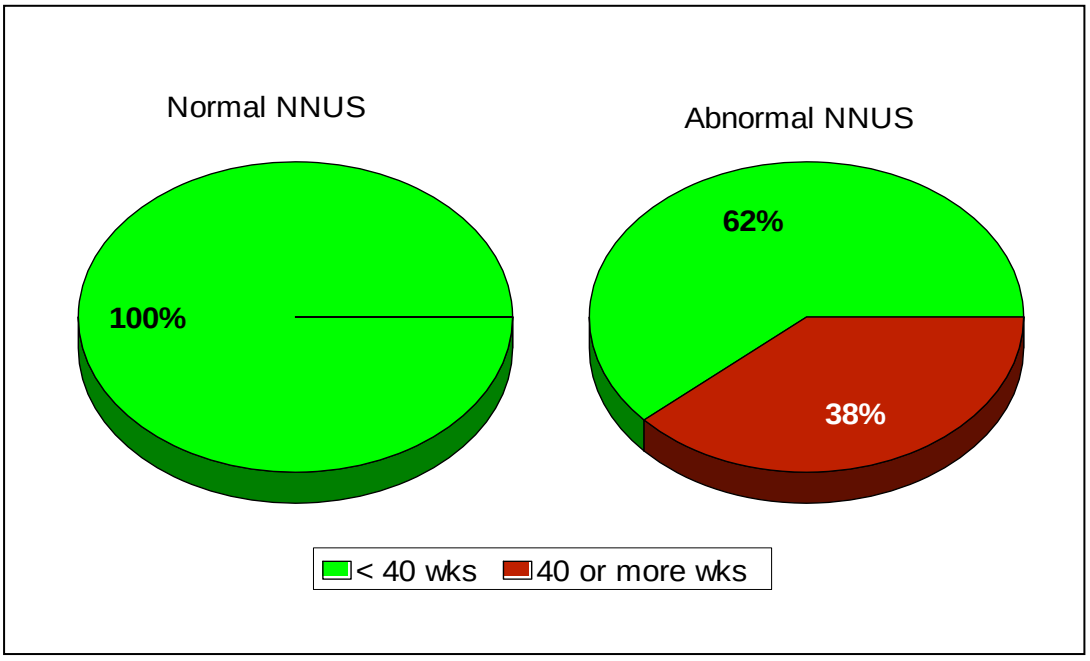


Figure (28): Relationship between Gestational Age and the normality of Neo-Neuro & Up Score (NNUS)

Table (21a): Relationship between Gestational Age and Neo-Neuro & Up Score (NNUS)

GA (wks)	Abnormal NNUS severity				Normal NNUS	Grand Total
	Mild	Moderate	Severe	Total		
<40	8 (50%)	4 (25%)	4 (25%)	16 (80%)	4 (20%)	20 (100)
40 or more	5 (50%)	3 (30%)	2 (20%)	10 (100%)	0	10 (100)
Total (% of Grand Total)	13 (50%)	7 (27%)	6 (23%)	26 (87%)	4 (13%)	30 (100%)
Chi square				χ^2 = 22.2 **		

** : Significant Chi Square χ^2 at 1% probability level ($p<0.01$) indicating the existence of highly significant differences between the percent distribution of Normal NNUS : Abnormal NNUS and Gestational age groups.



Neo-neuro & Upscore / GA

Figure (28a): Relationship between Gestational Age and the normality of Neo-Neuro & Up Score (NNUS)

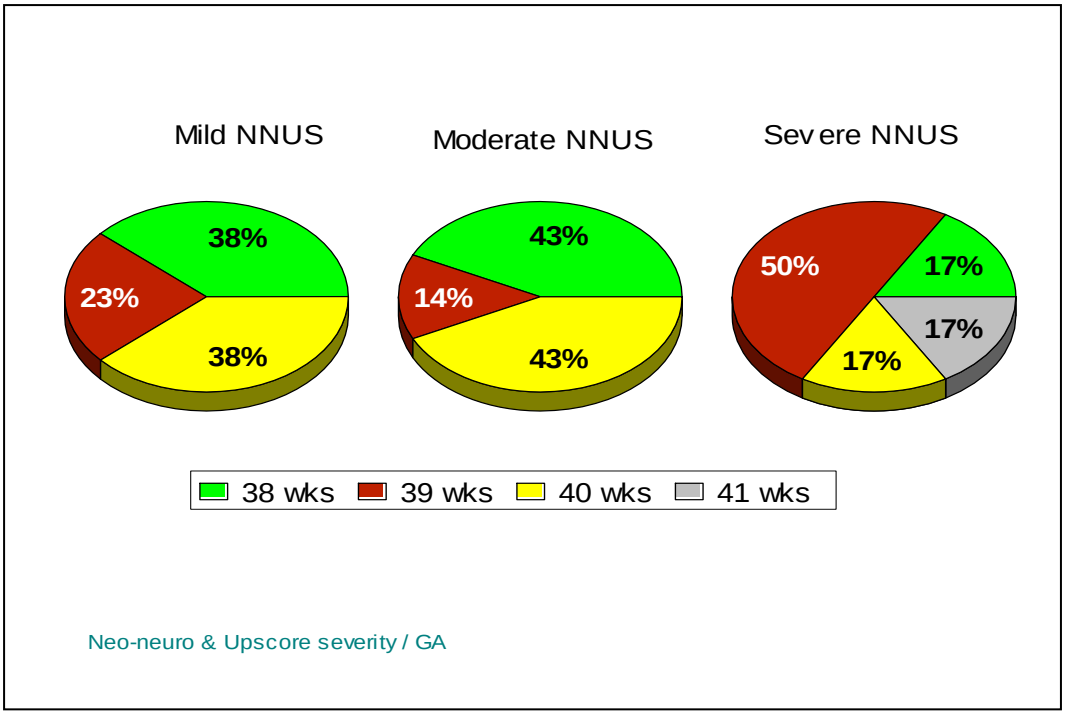


Figure (28b) : Relationship between Gestational Age and the severity of Abnormal Neo-Neuro & Up Score (NNUS)

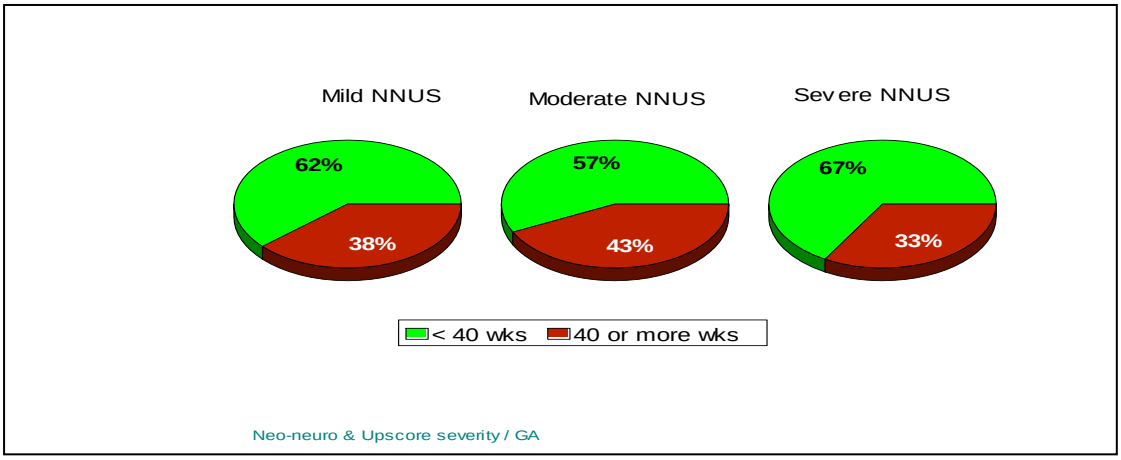


Figure (28b) : Relationship between Gestational Age and the severity of Abnormal Neo-Neuro & Up Score (NNUS)

Table (22): Relationship between Gender and Neo-Neuro & Up score (NNUS)

Gender	Abnormal NNUS severity				Normal NNUS	Grand Total
	Mild	Moderate	Severe	Total		
Male	6 (50%)	5 (42%)	1 (8%)	12 (92%)	1 (8%)	13 (100%)
Female	7 (50%)	2 (14%)	5 (36%)	14 (82%)	3 (18%)	17 (100%)
Total (% of Grand Total)	13 (50%)	7 (27%)	6 (23%)	26 (87%)	4 (13%)	30 (100%)
Chi square				$\chi^2 = 4.4$ *		

* : Significant Chi Square χ^2 at 5% probability level ($p<0.05$) indicating the existence of significant differences between the percent distribution of Normal NNUS : Abnormal NNUS and the two genders.

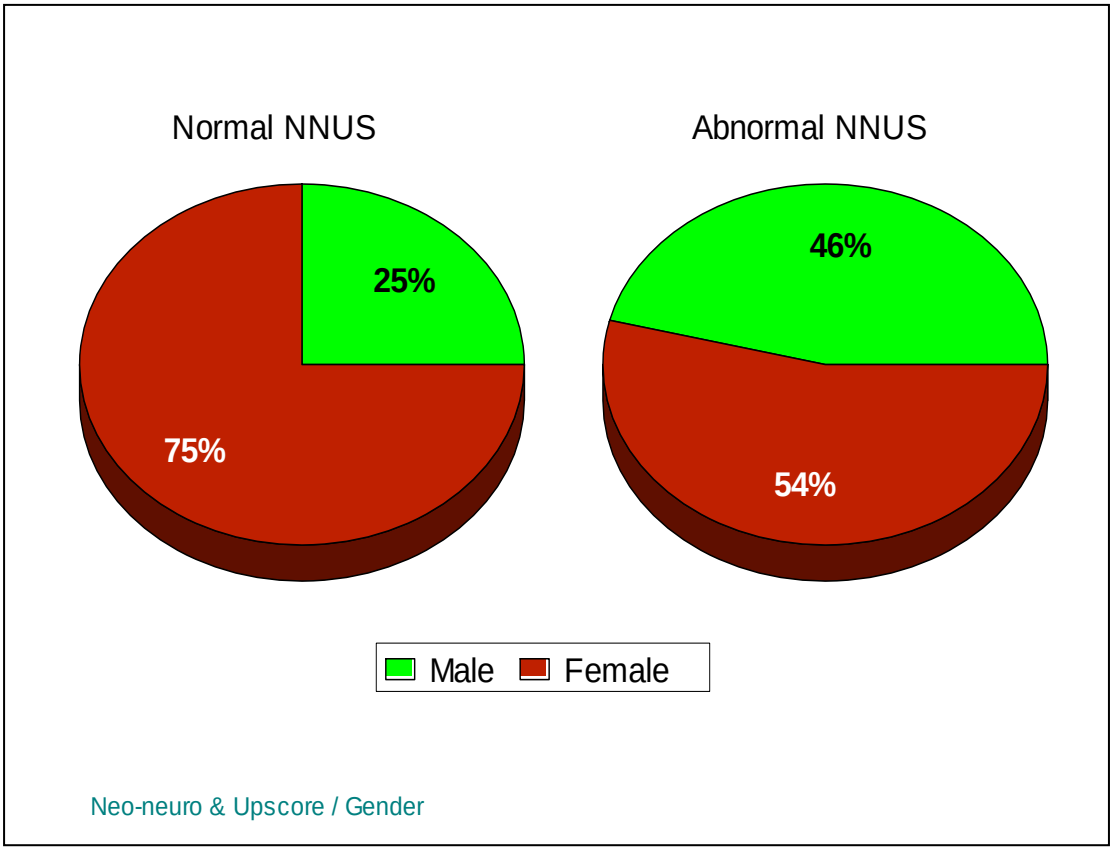


Figure (29a) : Relationship between Gender and the normality of Neo-Neuro & Up score (NNUS)

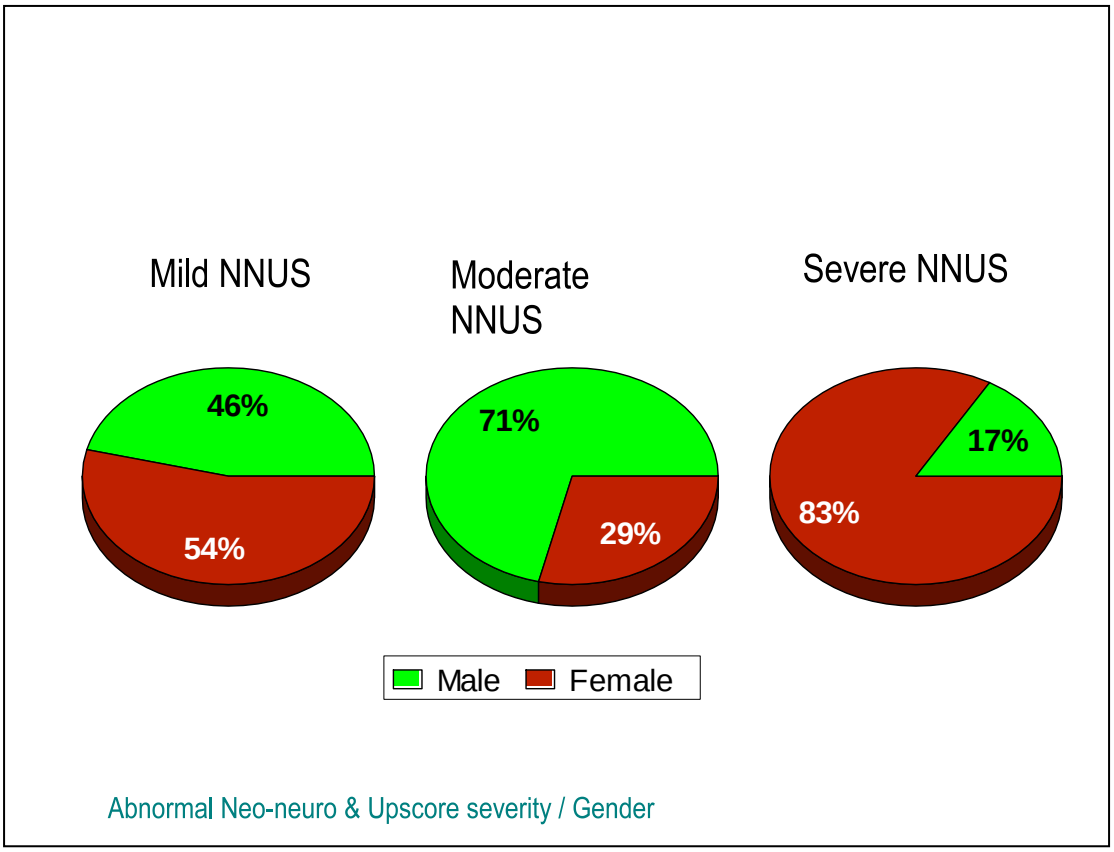


Figure (29b) : Relationship between Gender and the severity of Abnormal Neo-Neuro & Up score (NNUS)

Table (23): Relationship between Mode of Delivery and Neo-Neuro & Up score (NNUS)

Mode of Delivery	Abnormal NNUS severity				Normal NNUS	Grand Total
	Mild	Moderate	Severe	Total		
NVD	12 (50%)	7 (29%)	5 (21%)	24 (86%)	4 (14%)	28 (100%)
CS	1 (50%)	0	1 (50%)	2 (100%)	0	2 (100%)
Total (% of Grand Total)	13 (50%)	7 (27%)	6 (23%)	26 (87%)	4 (13%)	30 (100%)
Chi square				$\chi^2 = 15$ **		

** : Significant Chi Square χ^2 at 1% probability level ($p<0.01$) indicating the existence of highly significant differences between the percent distribution of Normal NNUS : Abnormal NNUS and the Modes of delivery.

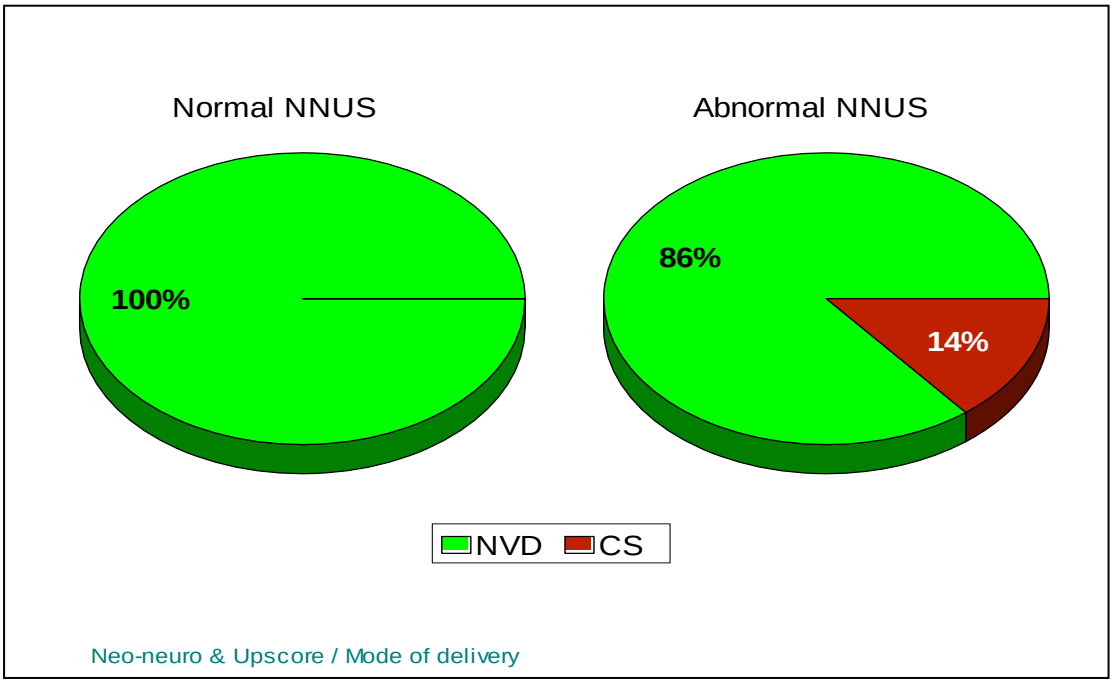


Figure (30a) : Relationship between Mode of delivery and the normality of Neo-Neuro & Up score (NNUS)

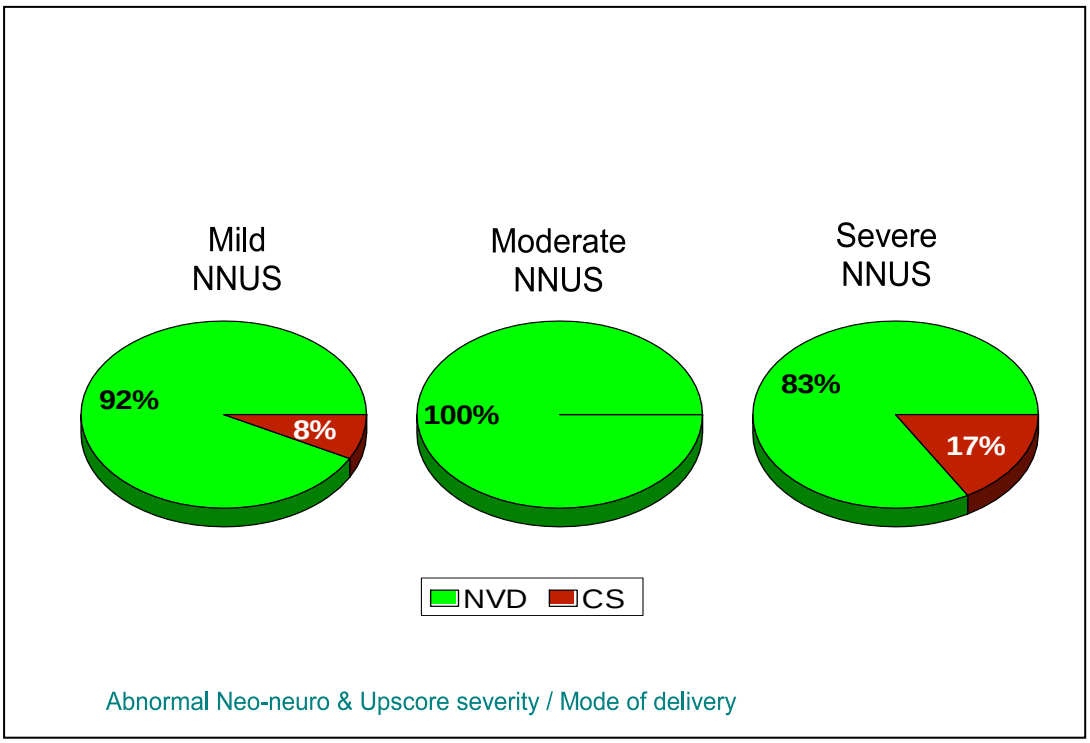


Figure (30b) : Relationship between Mode of delivery and the severity of Abnormal Neo-Neuro & Up score (NNUS)

Table (24): Relationship between Birth weight and Neo-Neuro & Up score (NNUS)

Birth weight (kgs)	Abnormal NNUS severity				Normal NNUS	Grand Total
	Mild	Moderate	Severe	Total		
Less than 2.5	4 (80%)	1 (20%)	0	5 (100%)	0	5 (100%)
2.5 or more	9 (43%)	6 (29%)	6 (29%)	21 (84%)	4 (16)	25 (100%)
Total (% of Grand Total)	13 (50%)	7 (27%)	6 (23%)	26 (87%)	4 (13%)	30 (100%)
Chi square				$\chi^2 = 17.4$ **		

** : Significant Chi Square χ^2 at 1% probability level ($p<0.01$) indicating the existence of highly significant differences between the percent distribution of Normal NNUS : Abnormal NNUS and the birth weight groups.

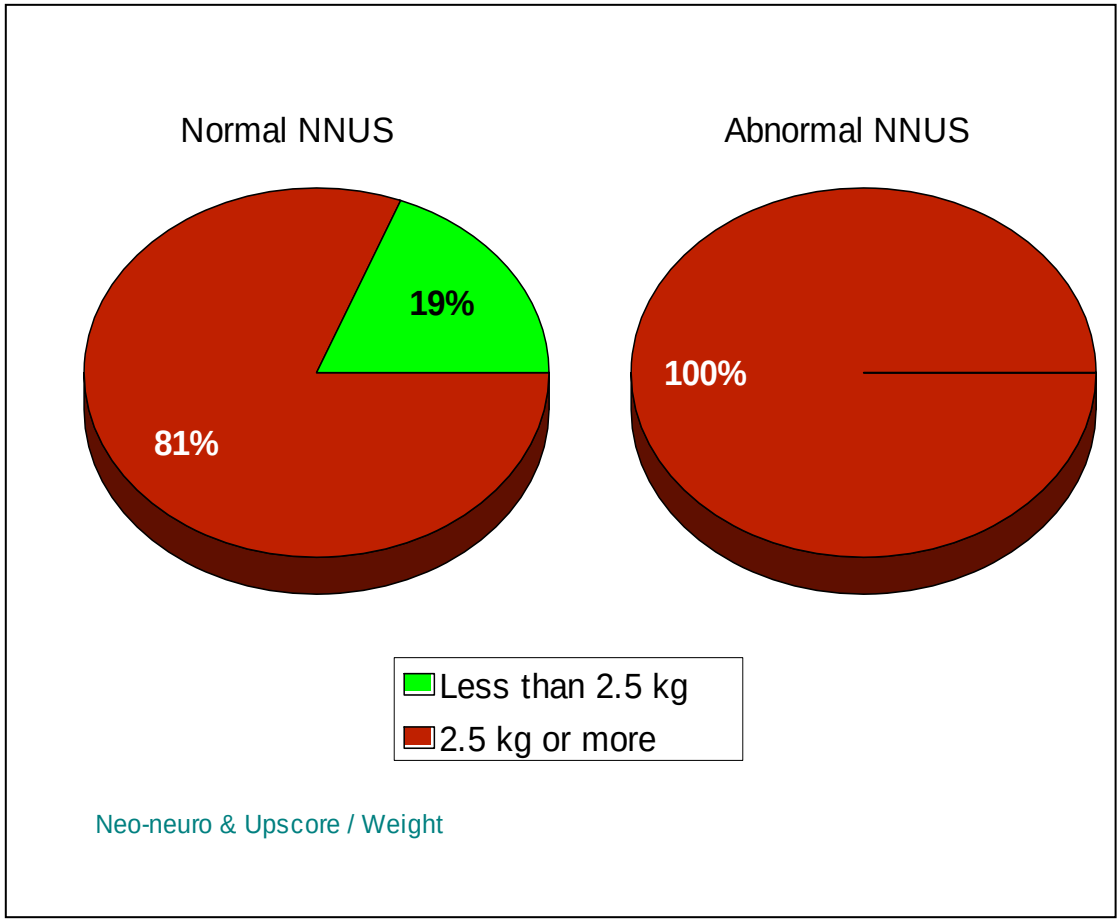


Figure (31a) : Relationship between Birth weight and the normality of Neo-Neuro & Up score (NNUS)

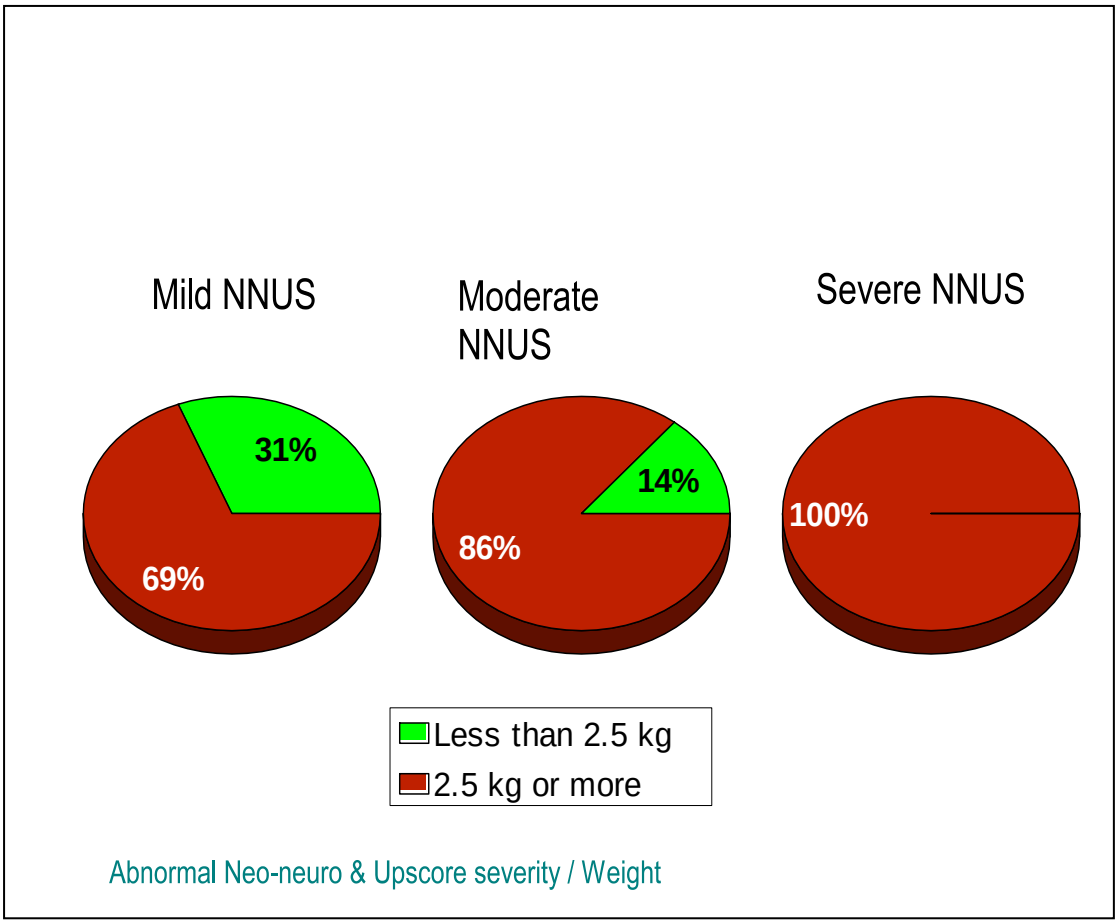


Figure (31b) : Relationship between Birth weight and the severity of Neo-Neuro & Up score (NNUS)

Table (25): Relationship between Sarnat Staging and Neo-Neuro & Up score (NNUS)

Sarnat Staging	Abnormal NNUS severity				Normal NNUS	Grand Total
	Mild	Moderate	Severe	Total		
Stage I	9 (69%)	4 (31%)	0	13 (87%)	2 (13%)	15 (100%)
Stage II	4 (36%)	3 (27%)	4 (36%)	11 (85%)	2 (15%)	13 (100%)
Stage III	0	0	2 (100%)	2 (100%)	0	2 (100%)
Total (% of Grand Total)	13 (50%)	7 (27%)	6 (23%)	26 (87%)	4 (13%)	30 (100%)
Chi square				$\chi^2 = 16.5$ **		

** : Significant Chi Square χ^2 at 1% probability level ($p<0.01$) indicating the existence of highly significant differences between the percent distribution of Normal : NNUS and the three stages of Sarnat Staging.

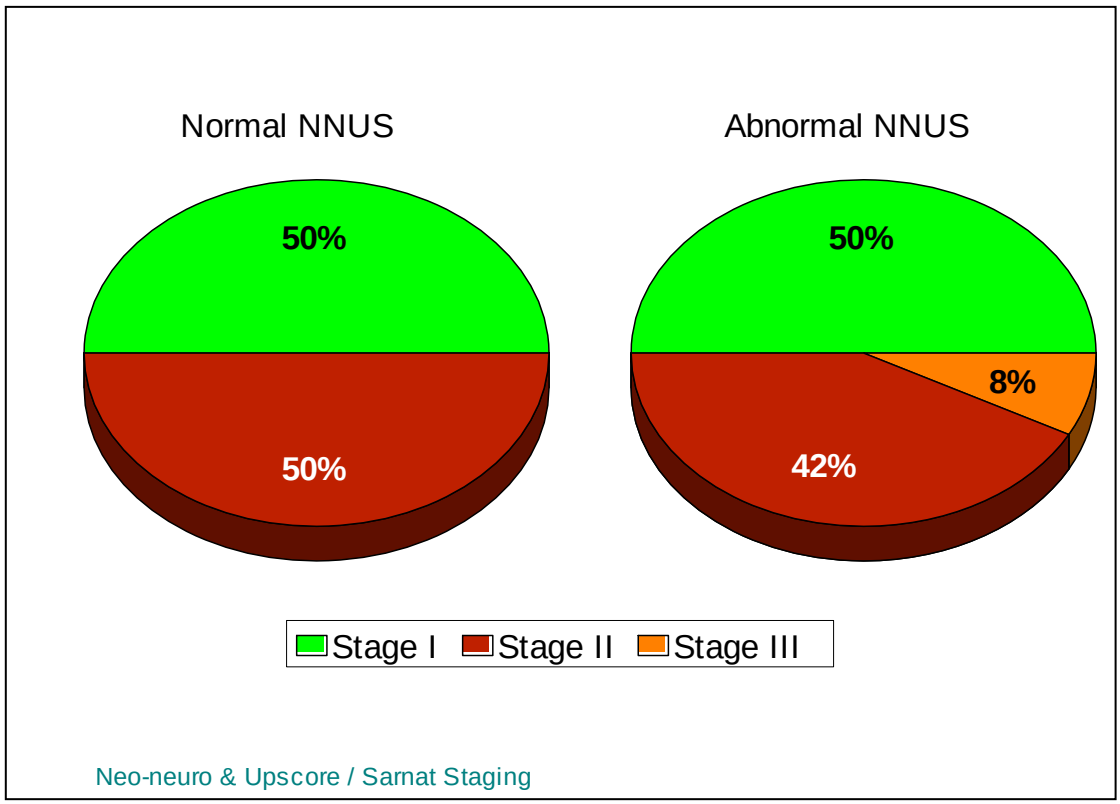


Figure (32a) : Relationship between Sarnat Staging and the normality of Neo-Neuro & Up score (NNUS)

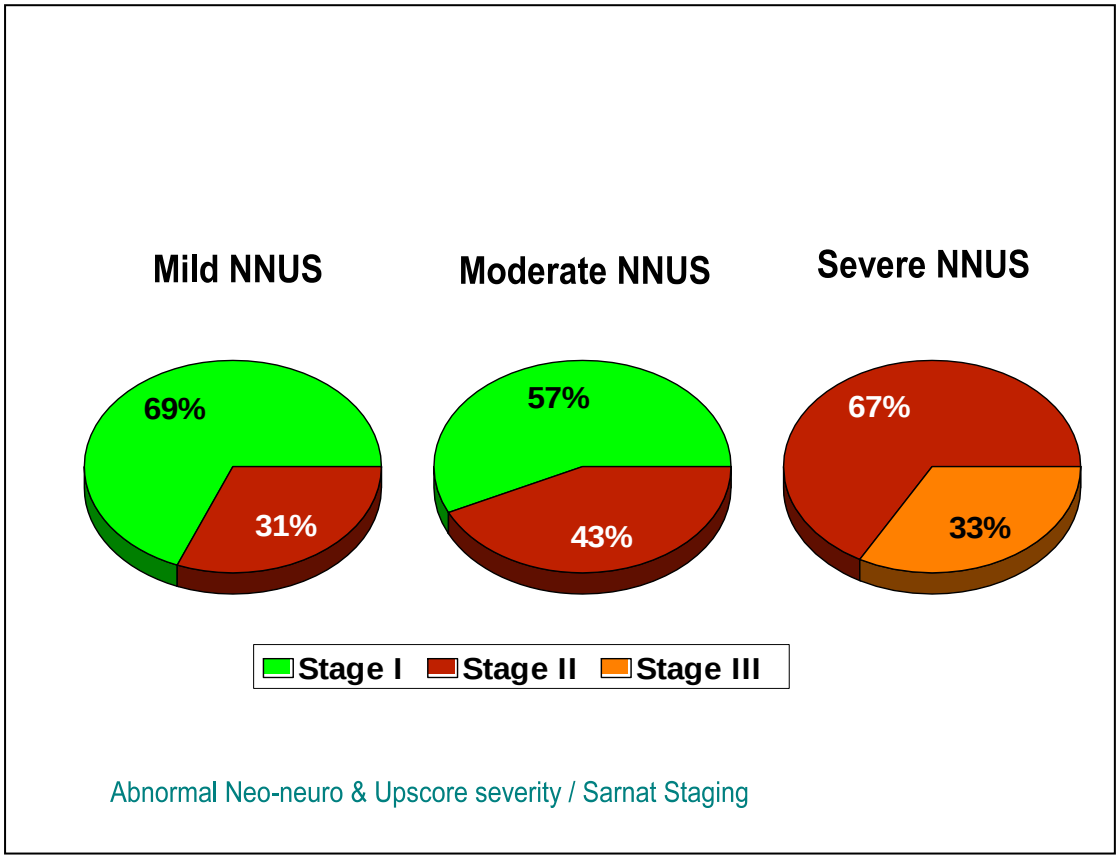


Figure (32b) : Relationship between Sarnat Staging and the severity of Neo-Neuro & Up score (NNUS)

Table (26): Relationship between the Outcome and Neo-Neuro & Up score (NNUS)

Outcome	Abnormal NNUS severity				Normal NNUS	Grand Total
	Mild	Moderate	Severe	Total		
Living	11 (55%)	5 (25%)	4 (20%)	20 (87%)	3 (13%)	23 (100%)
Died	2 (33%)	2 (33%)	2 (33%)	6 (86%)	1 (14%)	7 (100%)
Total (% of Grand Total)	13 (50%)	7 (27%)	6 (23%)	26 (87%)	4 (13%)	30 (100%)
Chi square				$\chi^2 = 0.05$ NS		

NS : Non-significant Chi Square χ^2 ($p>0.05$) indicating no significant differences between the percent distribution of Normal NNUS : Abnormal NNUS and the two outcomes.

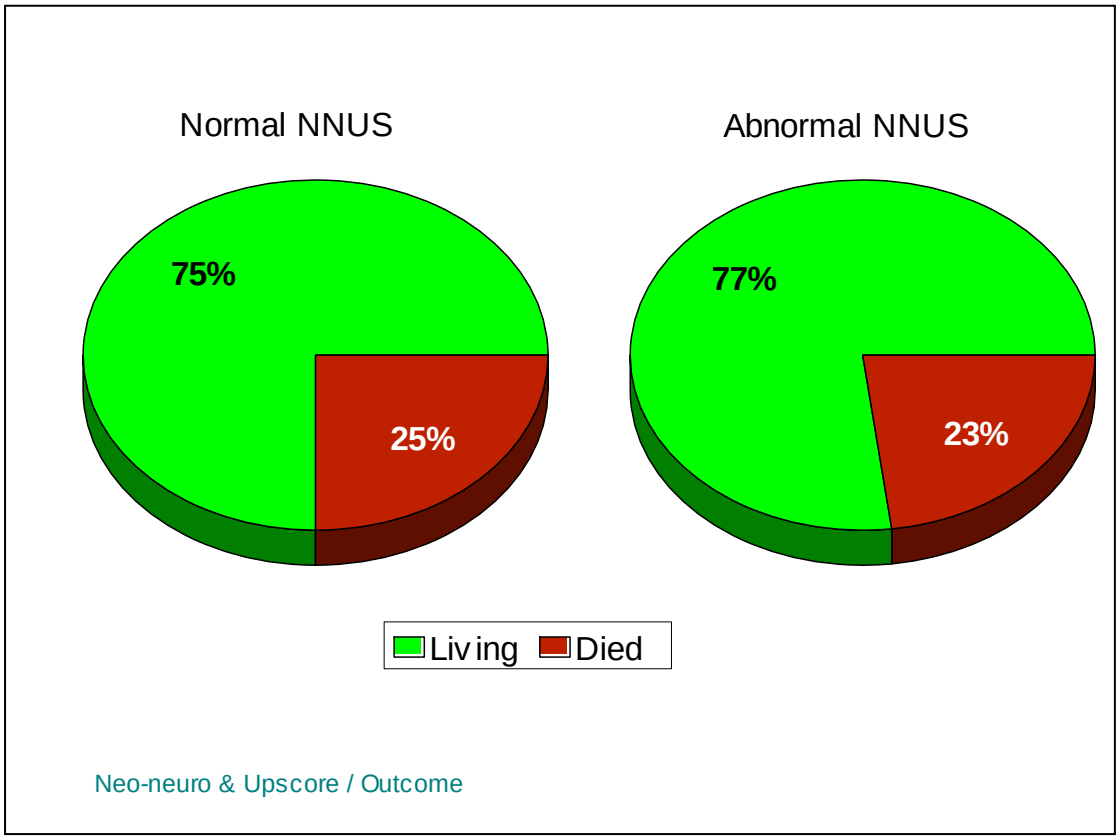


Figure (33a) : Relationship between the Outcome and the normality of Neo-Neuro & Up score (NNUS)

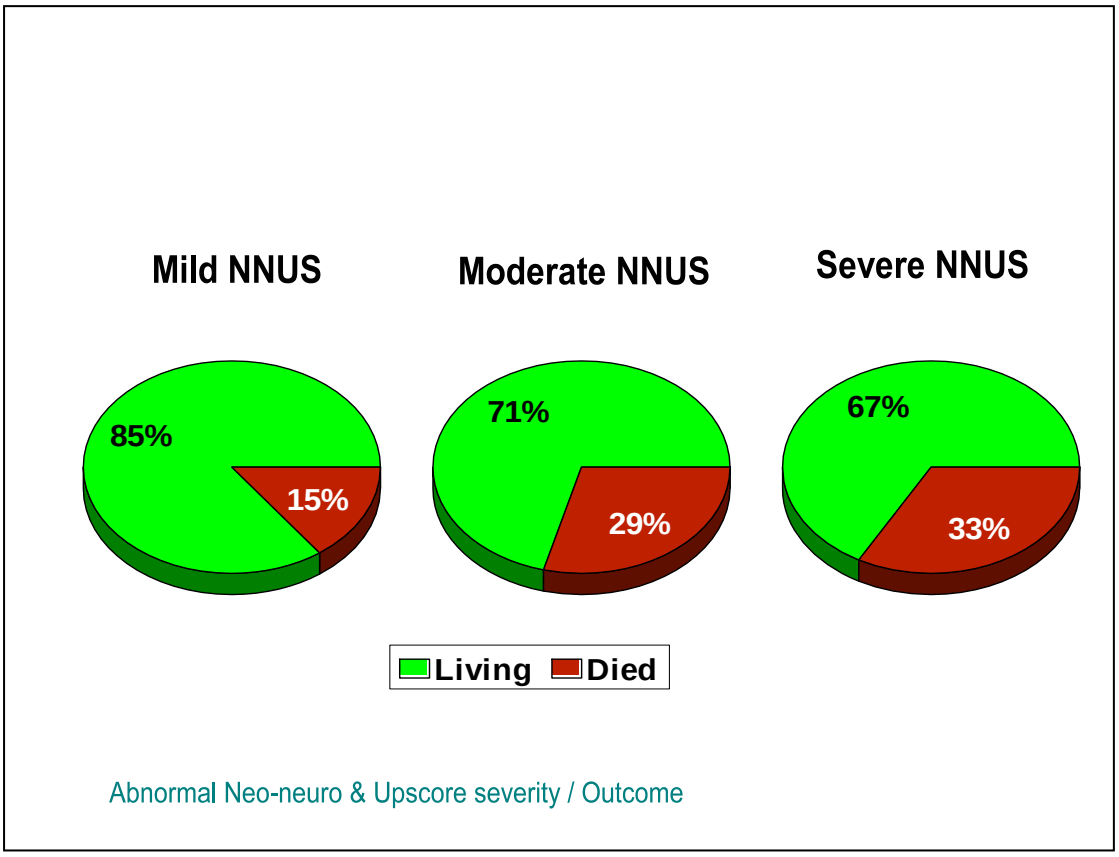


Figure (33b) : Relationship between the Outcome and the severity of Neo-Neuro & Up score (NNUS)

Table (27): Relationship between Cranial Ultrasound Findings and Neo-Neuro & Up score (NNUS)

Cranial Ultrasound Findings	Abnormal NNUS severity				Normal NNUS	Grand Total
	Mild	Moderate	Severe	Total		
Normal CUSF	6 (67%)	3 (33%)	0	9 (69%)	4 (31%)	13 (100)
Abnormal CUSF*	7 (41%)	4 (24%)	6 (35%)	17 (100%)	0	17 (100%)
Total	13 (50%)	7 (27%)	6 (23%)	26 (87%)	4 (13%)	30 (100%)
Chi square				$\chi^2 = 36.6$ **		

** : Significant Chi Square χ^2 at 1% probability level ($p<0.01$) indicating the existence of highly significant differences between the percent distribution of Normal NNUS : Abnormal NNUS and the Cranial Ultrasound Findings.

Table (28): Relationship between Abnormal Cranial Ultrasound Findings and Neo-Neuro & Up score (NNUS)

*Abnormal CUSF	Abnormal NNUS severity				Normal NNUS	Grand Total
	Mild	Moderate	Severe	Total		
Brain Oedema	5 (63%)	1 (12%)	2 25%)	8 (100%)	0	8 (100%)
Periventricular Leukomalacia (P.V.L.)	0	2 (67%)	1 (33%)	3 (100%)	0	3 (100%)
Brain Atrophy	1 (50%)	1 (50%)	0	2 (100%)	0	2 (100%)
Sub Ependymal Hematoma	1 (50%)	0	1 (50%)	2 (100%)	0	2 (100%)
Inter Ventricular hemorrhage (I.V.H)	0	0	2 (100%)	2 (100%)	0	2 (100%)

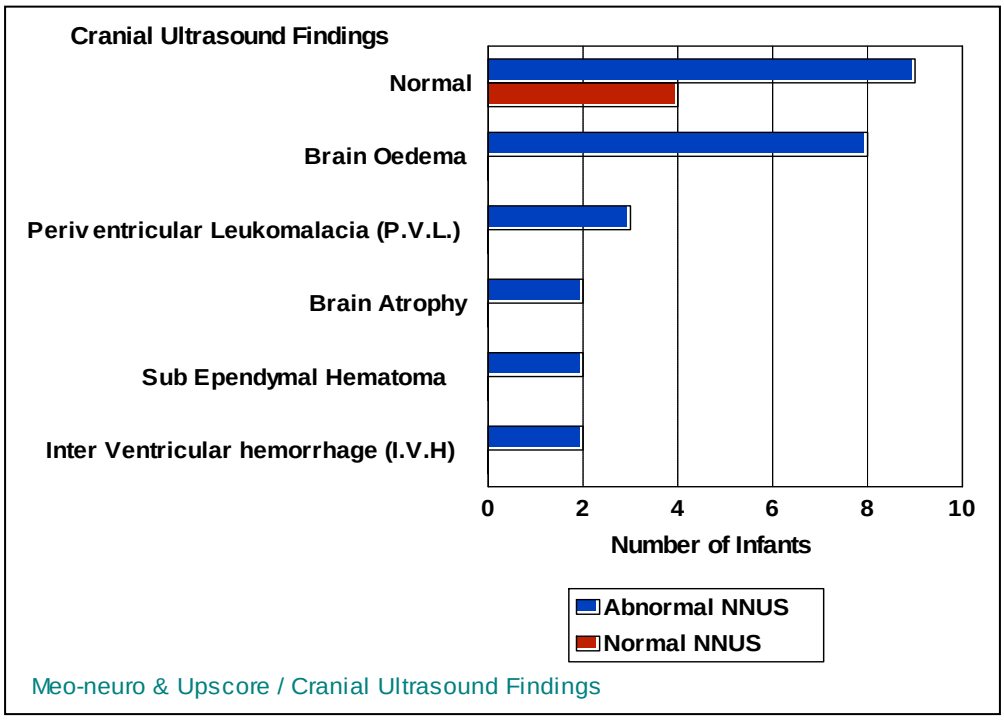


Figure (34a) : Relationship between Cranial Ultrasound Findings and the normality of Neo-Neuro & Up score (NNUS)

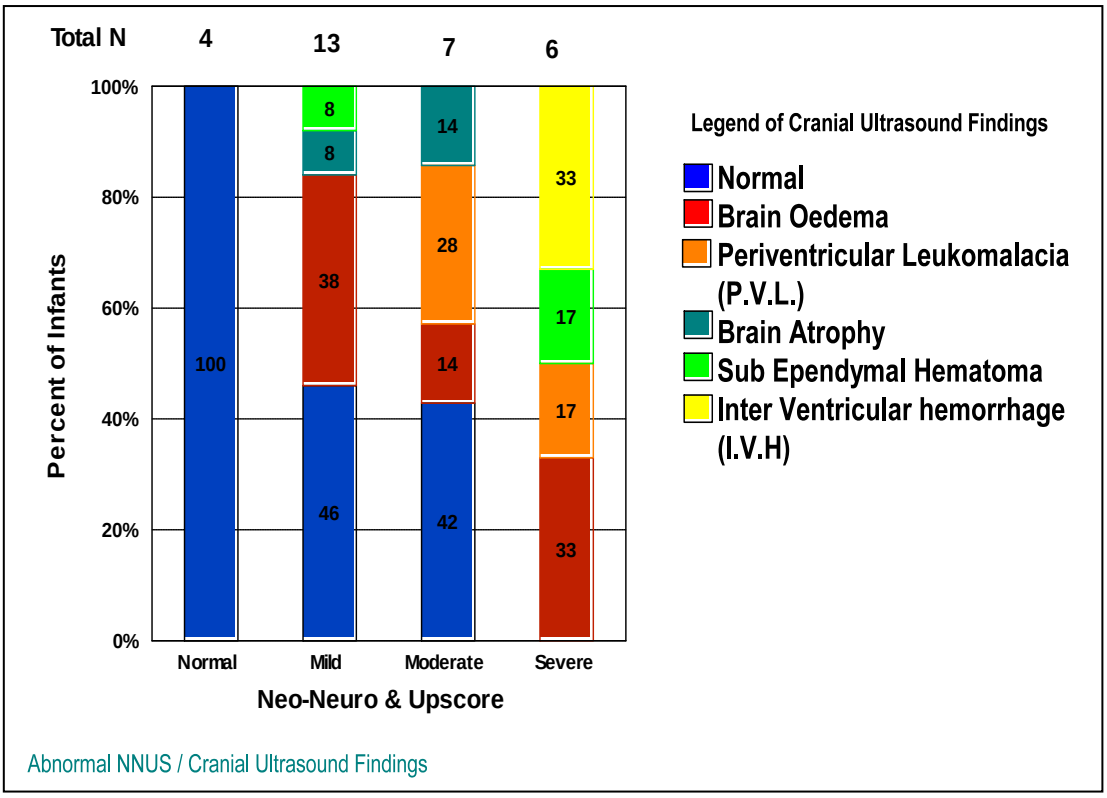


Figure (34b) : Relationship between Cranial Ultrasound Findings and the severity of Neo-Neuro & Up score (NNUS)

Table (29): Relationship between Sarnat staging and Cranial Ultrasound Findings CUSF

CUSF	Sarnat Staging			
	I	II	III	Total
Normal	8 (62%)	5 (38%)	0	13 (100%)
Brain Oedema	4 (50%)	3 (37%)	1 (13%)	8 (100%)
Periventricular Leukomalacia (P.V.L.)	1 (33%)	2 (67%)	0	3 (100%)
Brain Atrophy	1 (50%)	1 (50%)	0	2 (100%)
Sub Ependymal Hematoma	1 (50%)	1 (50%)	0	2 (100%)
Inter Ventricular hemorrhage (I.V.H)	0	1 (50%)	1 (50%)	2 (100%)
Total	15 (50%)	13 (43%)	2 (7%)	30 (100%)

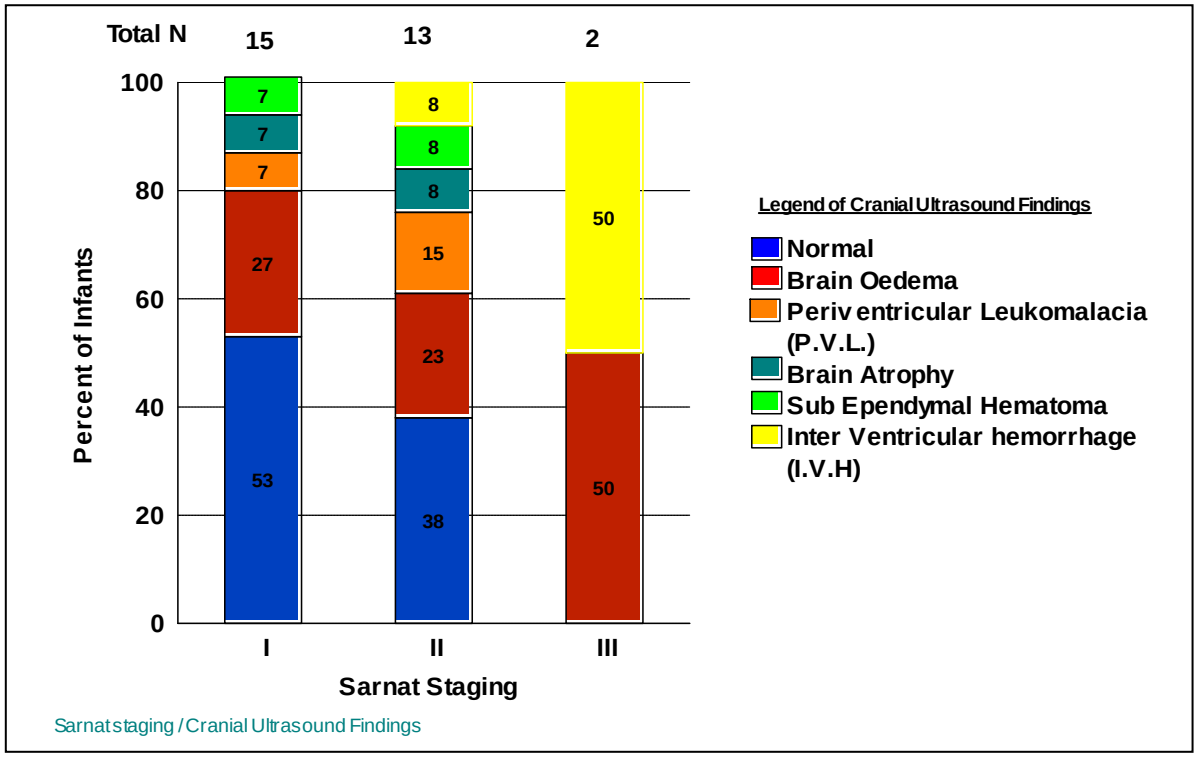


Figure (35): Relationship between Sarnat staging and Cranial Ultrasound Findings CUSF

Table (30): Relationship between Sepsis and Neo-Neuro & Up score (NNUS)

PROM	Abnormal NNUS severity				Normal NNUS	Grand Total
	Mild	Moderate	Severe	Total		
Yes	4 (50%)	3 (37%)	1 (13%)	8 (73%)	3 (27%)	11 (100%)
No	9 (50%)	4 (22%)	5 (28%)	18 (95%)	1 (5%)	19 (100%)
Total (% of Grand Total)	13 (50%)	7 (27%)	6 (23%)	26 (87%)	4 (13%)	30 (100%)
Chi square				χ^2 = 18.0 **		

** : Significant Chi Square χ^2 at 1% probability level ($p<0.01$) indicating the existence of highly significant differences between the percent distribution of Normal : NNUS and the presence of Sepsis.

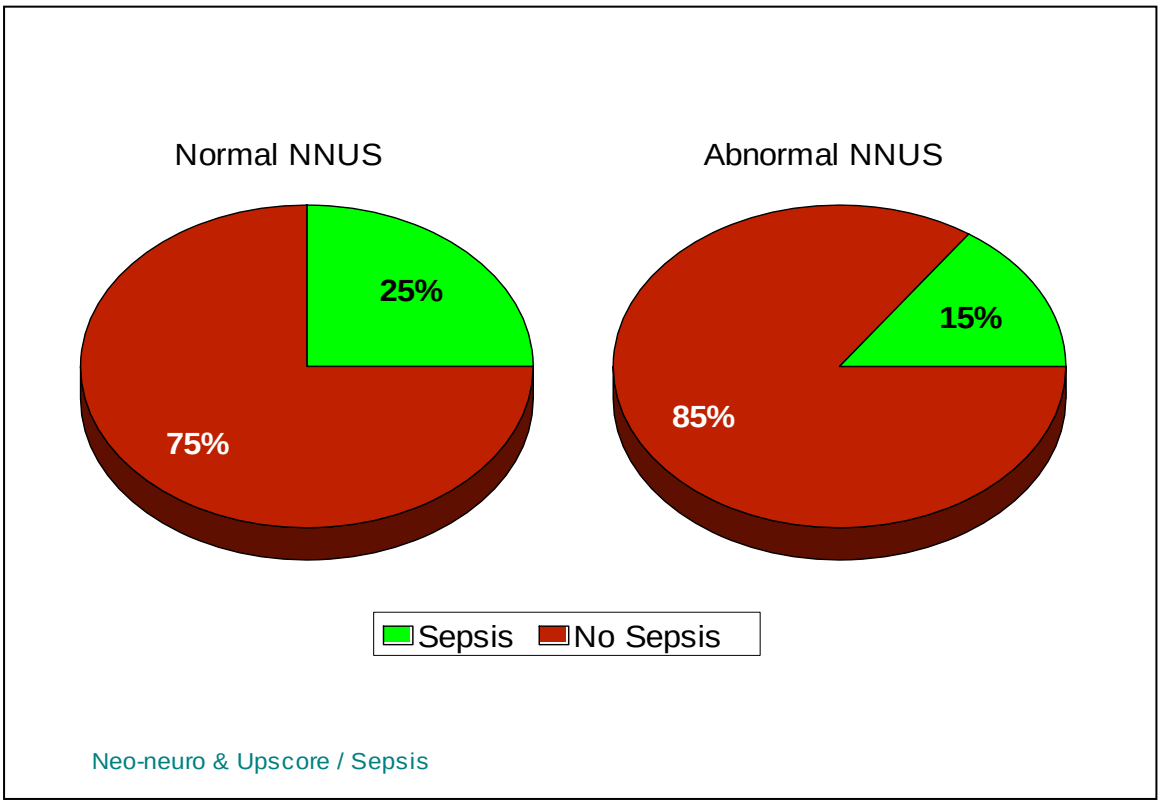


Figure (36a) : Relationship between Sepsis and the normality of Neo-Neuro & Up score (NNUS)

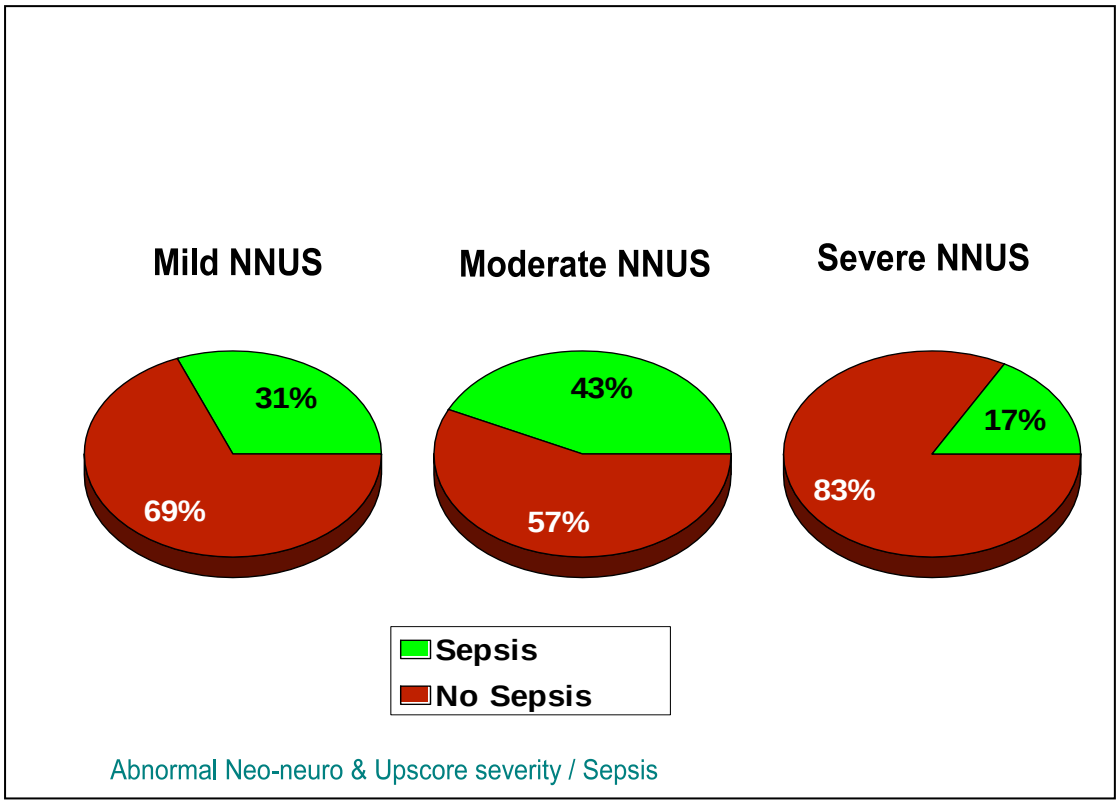


Figure (36b) : Relationship between Sepsis and the severity of Neo-Neuro & Up score (NNUS)

Table (31): Relationship between Diagnosis at Admission and the incidence/severity of Neo-Neuro & Up score (NNUS)

Diagnosis at Admission	Abnormal NNUS severity				Normal NNUS	Total
	Mild	Moderate	Severe	Total		
HIE	8 (50%)	5 (31%)	3 (19%)	16 (89%)	2 (11%)	18 (100%)
Other Diagnosis	5 (50%)	2 (20%)	3 (30%)	10 (83%)	2 (17%)	12 (100%)
Total	13 (50%)	7 (27%)	6 (23%)	26 (87%)	4 (13%)	30 (100%)
Chi square				χ^2 = 1.4 NS		

NS : Non-significant Chi Square χ2 (p>0.05) indicating no significant differences between the percent distribution of Normal NNUS : Abnormal NNUS and Diagnosis at admission.

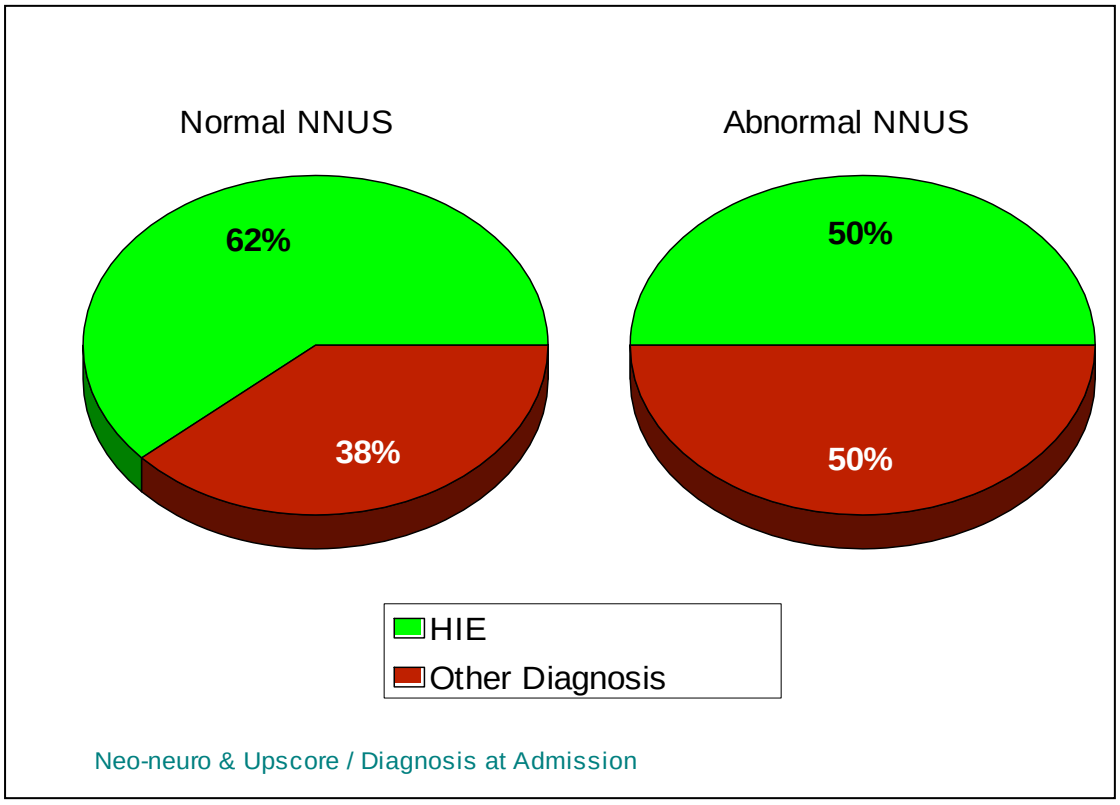


Figure (37a): Relationship between Diagnosis at Admission and the normality of Neo-Neuro & Up score (NNUS)

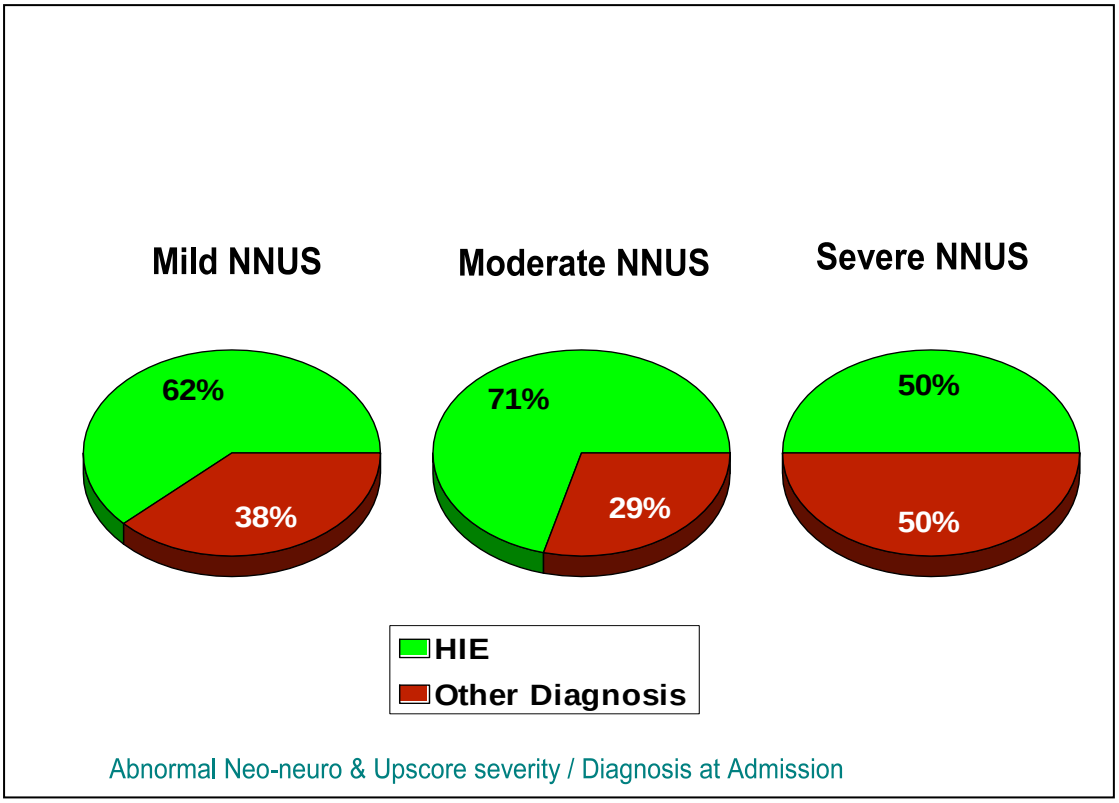


Figure (37b) : Relationship between Diagnosis at Admission and the severity of Neo-Neuro & Up score (NNUS)

Correlations

'r' value between BW and HC 0.52 **

** Highly significant correlation coefficient at 1% probability level ($p<0.01$)

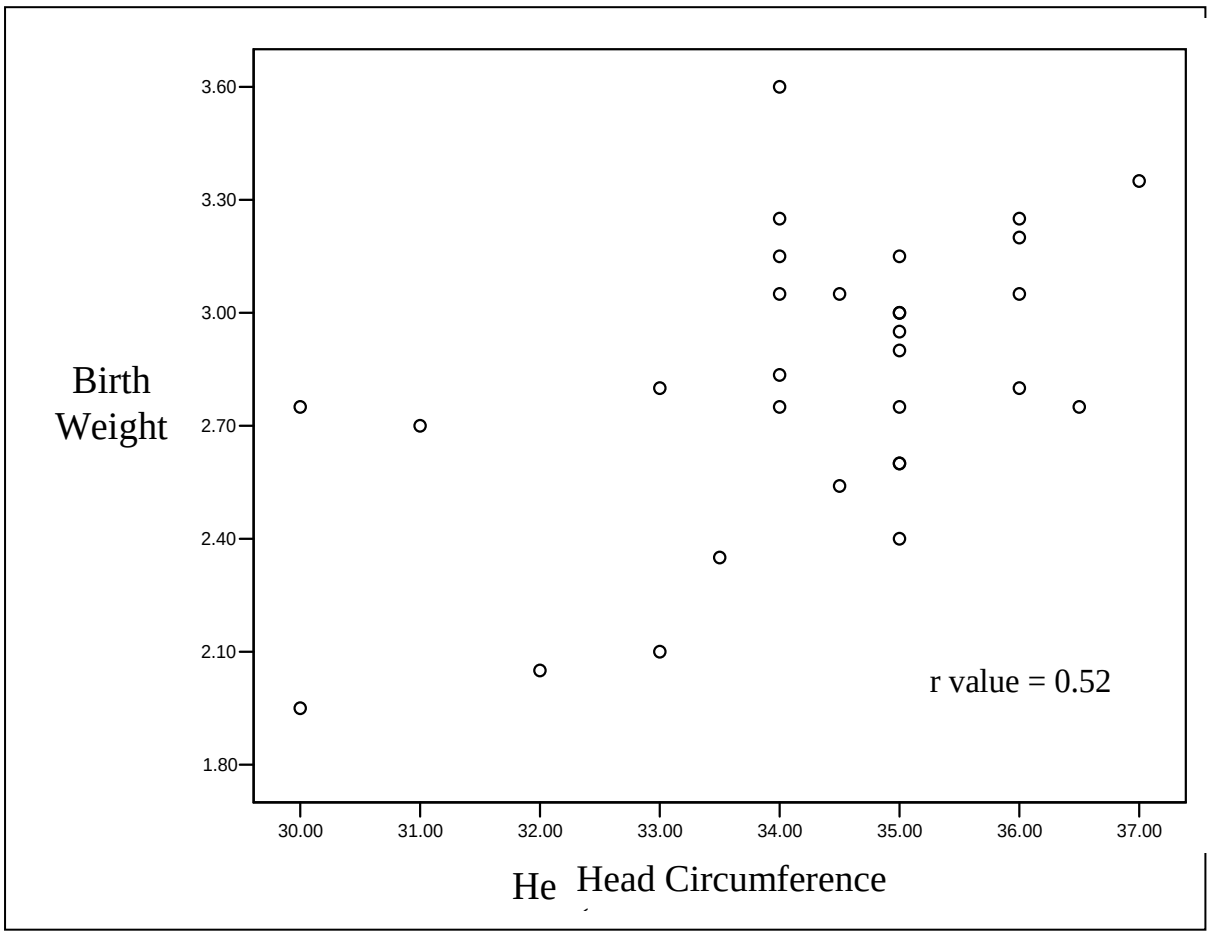


Figure (38) : Scatter diagram of the correlation coefficient between Birth Weight and Head Circumference

Table (32): Relationship between Cranial Ultrasound Findings, Neo-Neuro & Up score (NNUS) and Sarnat stages

Neo-Neuro & Up Score (NNUS).		Sarnat stages		Cranial Ultrasound Findings (CUSF)	
				Normal	Abnormal
Normal	4 (13.3%)	**Stage I**	2 (50%)	2 (50%)	0
		Stage II	2 (50%)	2 (50%)	0
		Stage III	0	0	0
Mild	13 (43.3%)	**Stage I**	9 (69.2%)	5 (38.5%)	4 (30.8%)
		Stage II	4 (30.8%)	1 (8.7%)	3 (23.1%)
		Stage III	0	0	0
Moderate	7 (23.3%)	**Stage I**	4 (57.1%)	2 (28.6%)	2 (28.6%)
		Stage II	3 (42.9%)	2 (28.6%)	1 (14.3%)
		Stage III	0	0	0
Severe	6 (20.0%)	**Stage I**	0	0	0
		Stage II	4 (66.7%)	0	4 (66.7%)
		Stage III	2 (33.3%)	0	2 (33.3%)