Data Analysis

## Statistical Analysis

We present descriptive summaries of key sample statistics. We compared baseline sample characteristics between those children found to be at risk of OSA and those not at risk. We used the Fisher’s exact test or chi-square tests for categorical variables. The Wilcoxon rank sum test or Kruskal–Wallis test was used for continuous variables. We considered p-values of <0.05 to be statistically significant.

## Descriptive Analysis

Overall, a total of 79 children with a mean age of 4.6 (2, 10) were recruited. Of these, 47 (59%) were male. Comparing baseline characteristics between children with possible diagnosis of SDB 58 (73.42) and those without revealed a significant difference in suspected allergic rhinitis (p=0.017) and those with suspected OSA (p < 0.000). There were however no significant differences in other population characteristics as shown in table 1.

Table 1: Baseline characteristics of all participants with and without SDB’

| **Characteristics** | **All participants n=79** | **PSQ > 0.33 n=58** | **PSQ < 0.33 n=21** | **p-value** | **CI** |
| --- | --- | --- | --- | --- | --- |
| Age | 4.57±1.96 | 4.33±1.75 | 5.22±2.4 | 0.153 | -1.6001,0.1999 |
| 2-5 yrs | 57(72) | 44(76) | 13(62) |  |  |
| 6-10 yrs | 22(28) | 14(24) | 8(38) |  |  |
| Gender, n(%) |  |  |  | 0.45 | 0.4771,4.5744 |
| Male | 47(59) | 36(62) | 11(52) |  |  |
| Female | 32(41) | 22(38) | 10(48) |  |  |
| Asthma, n(%) | 26(33) | 19(33) | 7(33) | 1 | 0.2657,3.1044 |
| Allergic rhinitis, n(%) | 42(53) | 36(62) | 6(29) | 0.017 | 1.245,14.6231 |
| BMI(kg/m^2) | 14.43±2.22 | 14.36±2.41 | 14.62±1.6 |  |  |
| Birth weight category, n(%) |  |  |  | 0.101 | 0,1.5513 |
| <2.5 kgs | 8(10) | 8(14) | 0(0) |  |  |
| >=2.5 kgs | 71(90) | 50(86) | 21(100) |  |  |
| Hospital category, n(%) |  |  |  | 0.181 | 0.6047,10 |
| Private | 14(18) | 8(14) | 6(29) |  |  |
| Public | 65(82) | 50(86) | 15(71) |  |  |
| BMI category, n(%) |  |  |  | 0.646 |  |
| Underweight | 4(5) | 3(5) | 1(5) |  |  |
| Normal | 63(80) | 44(76) | 19(90) |  |  |
| Overweight | 8(10) | 7(12) | 1(5) |  |  |
| Obese | 4(5) | 4(7) | 0(0) |  |  |
| Height | 109.99±17.55 | 109.14±18.07 | 112.36±16.23 |  |  |
| SDB,n(%) | 58(73) | 58(100) | 0(0) |  |  |
| OSA,n(%) | 44(56) | 40(69) | 4(19) | 0 | 2.516,42.807 |

A total of 14 (18) childen and caregivers interviewed after treatment of SDB related symptoms showed signs of SDB (PSQ score >0.33). There were however no significant inter group differences in overal characteristics between chilldren with scores over 0.33 and those with scores lower than 0.33. More descriptive results are as presented in the table 2.

Table 2: Characteristics of participants with and without SDB at 6-8 weeks post operation

| **Characteristics** | **All participants n=79** | **PSQ > 0.33 n=14** | **PSQ < 0.33 n=65** | **p-value** | **CI** |
| --- | --- | --- | --- | --- | --- |
| Age | 4.57±1.96 | 4.83±1.57 | 4.51±2.05 | 0.301 | -0.5,1.5 |
| 2-5 yrs | 57(72) | 8(57) | 49(75) |  |  |
| 6-10 yrs | 22(28) | 6(43) | 16(25) |  |  |
| Gender, n(%) |  |  |  | 0.45 | 0.4771,4.5744 |
| Male | 47(59) | 10(71) | 37(57) |  |  |
| Female | 32(41) | 4(29) | 28(43) |  |  |
| Asthma, n(%) | 26(33) | 5(36) | 21(32) | 1 | 0.2456,4.0735 |
| Allergic rhinitis, n(%) | 42(53) | 9(64) | 33(51) | 0.533 | 0.4612,7.3345 |
| BMI(kg/m^2) | 14.43±2.22 | 14.14±1.44 | 14.49±2.36 |  |  |
| Birth weight category, n(%) |  |  |  | 1 | 0.174,76.0541 |
| <2.5 kgs | 8(10) | 1(7) | 7(11) |  |  |
| >=2.5 kgs | 71(90) | 13(93) | 58(89) |  |  |
| Hospital category, n(%) |  |  |  |  |  |
| Private | 14(18) | 0(0) | 14(22) |  |  |
| Public | 65(82) | 14(100) | 51(78) |  |  |
| BMI category, n(%) |  |  |  |  |  |
| Underweight | 4(5) | 0(0) | 4(6) |  |  |
| Normal | 63(80) | 12(86) | 51(78) |  |  |
| Overweight | 8(10) | 2(14) | 6(9) |  |  |
| Obese | 4(5) | 0(0) | 4(6) |  |  |
| Height | 109.99±17.55 | 111.25±12.95 | 109.72±18.47 |  |  |
| SDB,n(%) | 58(73) | 14(100) | 44(68) |  |  |
| OSA,n(%) | 44(56) | 7(50) | 37(57) | 0.769 | 0.2011,2.8629 |

Additional summaries are in appendices.

## General estimating equation mode

We further fitted a generalized estimating equation model to explore predictors of residual SDB scores > 0.33 post operation of patients. Choice of a generalized estimating equation model was since this was a longitudinal study and we needed to account for the correlated nature of observations. We used glmnet framework for variable selection and allergic rhinitis, enuresis, age and gender were the only variables with non-zero coefficients as shown:

|  |  |  |  |
| --- | --- | --- | --- |
|  | row | column | value |
| 2 | Allergic rhinitis (yes) | 1 | 0.1836 |
| 3 | height | 1 | -0.0001 |
| 4 | Age (6-10) | 1 | 0.2901 |
| 5 | Sex (male) | 1 | 0.1811 |
| 6 | Wet bed (yes) | 1 | 0.3568 |
| 7 | Wet bed(no) | 1 | 0.4157 |

We present resulting coefficient estimates, standard errors, odds and confidence intervals of resulting GEE model. Overall, having allergic rhinitis increased the odds of a having residual SDB by a factor of 2.67, 95% CI (0.6637, 10.7068) when compared to not having allergic rhinitis. Additionally, being older (children of 6-10 years) increased the odds of residual SDB by a factor of 7.22 (0.7198, 72.44) when compared to the younger group (2-5 years). A similar inference can be drawn in the summaries below:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| variable | coef | se | odds | Lower CI | Upper CI |
| Allergic rhinitis (yes) | 0.9805 | 0.7094 | 2.6657 | 0.6637 | 10.7068 |
| Asthma (yes) | 0.2624 | 0.8157 | 1.3000 | 0.2628 | 6.4308 |
| height | -0.0868 | 0.0382 | 0.9168 | 0.8507 | 0.9881 |
| birth weight>= 2.5 kgs | -0.9008 | 1.5009 | 0.4063 | 0.0214 | 7.6974 |
| Age (6-10) | 1.9770 | 1.1765 | 7.2213 | 0.7198 | 72.4480 |
| Sex (male) | 0.4405 | 0.7392 | 1.5535 | 0.3649 | 6.6145 |
| bmi | -0.1334 | 0.2062 | 0.8751 | 0.5842 | 1.3109 |
| Wet bed (Yes) | 2.8850 | 1.0422 | 17.9030 | 2.3217 | 138.0502 |
| Wet bed (No) | 2.9694 | 1.1243 | 19.4797 | 2.1506 | 176.4419 |