# CHARACTERIZATION OF CHILDREN BORN SMALL FOR GESTATIONAL AGE WITHIN THE AUSTRALIAN INDICATIONS FOR GROWTH HORMONE THERAPY: AN OZGROW ANALYSIS

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## Introduction

Children born small for gestational age (SGA) without subsequent catch up growth is an indication for growth hormone (GH) treatment in Europe, the US, and Korea but not in Australia. However, many SGA children are likely to be included under the Australian "Short Stature and Slow Growth" (SSSG) indication for GH treatment. It is unknown to what extent children born SGA are included in the Australian indications or how they differ from appropriate for gestational age (AGA) patients within each indication and gender.

We characterize and compare birth, parental auxology, and initial GH-treatment data of SGA and AGA patients by gender and Australian indication for GH. Analyses are confined to SSSG, GH Deficiency (GHD), Turner Syndrome (TS), and Prader-Willi Syndrome (PWS).

## Methods

SGA was defined as birthweight below the 10th Australian centile for gestation period. Frequencies of SGA for males (M) and females (F) were calculated for each indication. Frequencies were compared to an expected frequency of 10% (Chi square). SGA and AGA were compared for M and F of each indication for gestation age, birth weight standard deviation score (SDS), birth length (cm), mean parental height SDS, GH starting age, starting height SDS, and starting Dose (mg/m$^2$/wk). Comparisons presented as box plots and equality of means were tested using t-tests.

## Results

SGA was overrepresented, ie >10%, in each of the indications for GH and for both genders (Table 1).

| Indication | Gender | SGA/AGA | n | %SGA | P SGA%=10% |
|---|---|---|---|---|---|
| GHD | F | AGA | 218 | | |
| | | SGA | 53 | 19.6 | 1.4x10$^{-7}$ |
| | M | AGA | 361 | | |
| | | SGA | 110 | 23.3 | 4.4x10$^{-22}$ |
| PWS | F | AGA | 53 | | |
| | | SGA | 44 | 45.4 | 1.7x10$^{-46}$ |
| | M | AGA | 37 | | |
| | | SGA | 49 | 57.0 | 8.9x10$^{-48}$ |
| SSSG | F | AGA | 471 | | |
| | | SGA | 264 | 35.9 | 9.8x10$^{-234}$ |
| | M | AGA | 820 | | |
| | | SGA | 501 | 37.9 | 6.5x10$^{-251}$ |
| TS | F | AGA | 324 | | |
| | | SGA | 161 | 33.2 | 8.9x10$^{-170}$ |

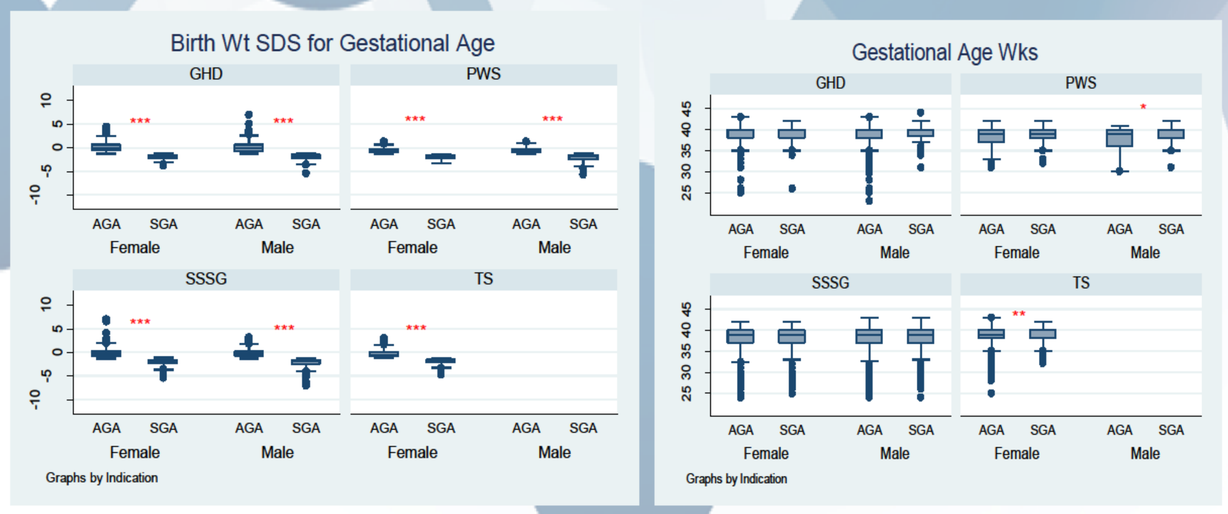
**Table 1.** percentage of patients SGA for each indication and gender compared to the expected 10%.

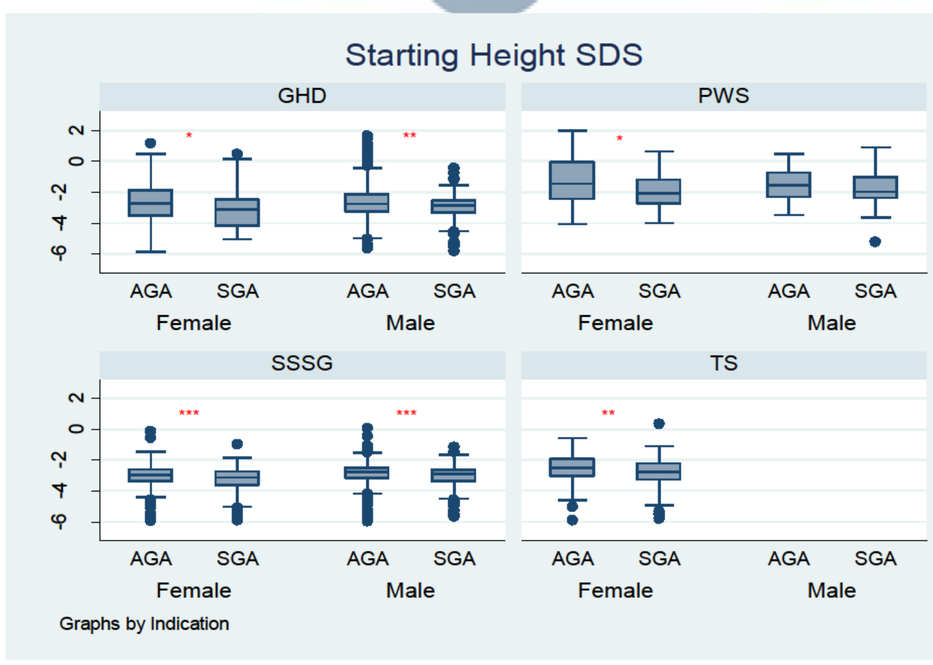
From Figure 1, as would be expected, birth weight SDS and birth length are significantly smaller for SGA patients for all indications (1.7-2.1 SDS and 2-3cm respectively). Starting height SDS was shorter (0.2-0.5 SDS) for SGA patients although starting age was only different for SSSG patients (SGA were approximately 1 year younger). Parental heights only differed between AGA and SGA for male GHD and SSSG patients (0.2-0.3 SDS shorter). Starting doses were lower for male SGA from the SSSG indication (4.9mg/m$^2$/wk) compared to AGA males (5.1mg/m$^2$/wk ).

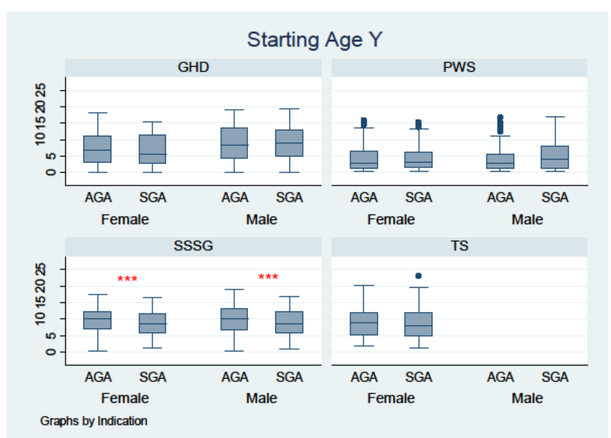
## Discussion and Conclusions

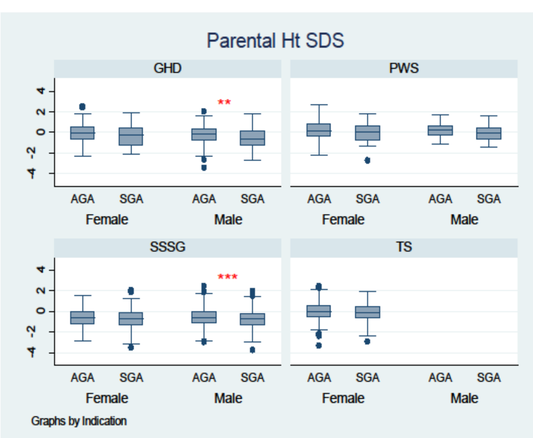
SGA was very overrepresented in each of the major indications for GH treatment in Australia comprising 20-57% of patients in contrast to 10% of the general birth population. It would appear that SGA patients requiring GH treatment are being successfully ascertained. SGA patients generally started GH treatment at a shorter height than their AGA counterparts but this was not accompanied by any increase in starting dose or overall a younger starting age. Whether SGA should be considered as a specific indication for GH treatment, or if SGA should be treated differently within existing indications, will depend on whether the SGA patients respond differentially from others within their present indication. Current analyses are addressing treatment response in the first three years of treatment.

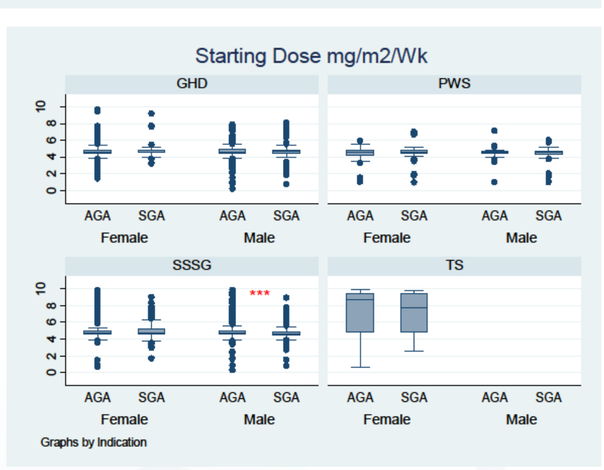
**Figure 1.** Box Plots (median, quartiles, 2.5th, and 97.5th centiles) of birth measures, parental height, and early treatment data by indication and gender. * 0.01<P<0.05, ** 0.001<P<0.01, *** P<0.001

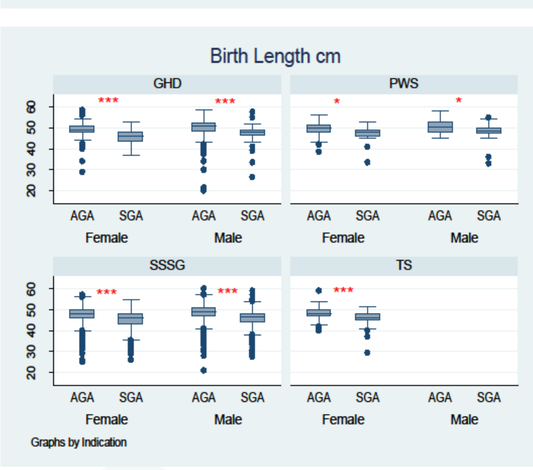


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