Incidence of cranial MRI abnormalities in patients with isolated growth hormone deficiency: 20 years of results

Background
Patients with isolated growth hormone deficiency (GHD) will routinely have magnetic resonance imaging (MRI) of the pituitary and brain to assess pituitary size and presence of any intracranial lesions. The result may change the threshold for monitoring for further hormone deficiencies. However the test may also detect unexpected or unrelated abnormalities.

Methods
The biochemistry and MRI reports of children with isolated GHD (peak GH <7µg/L) born in a tertiary centre between 1997 from 2017 were reviewed. All children with multiple pituitary hormone deficiencies, septo-optic-dysplasia spectrum, and patients with known malignancies were excluded. Extra-cranial abnormalities were excluded.

Aim
To review the incidence of abnormal pituitary magnetic resonance imaging in children with a diagnosis of isolated GHD, and to characterise the types of abnormalities seen.

Results
81 children were diagnosed with isolated GHD. Of these, 72 children had MRI results available (figure 1). Median age of diagnosis was 5.99 years (range 0.62-18.69) with a median height SDS or -3.45 (-0.33 to -8.41) at diagnosis. The median GH level was 3.25µg/L, with the same rate of abnormalities in the group above and below the median GH level.

Of the 34 children who had abnormal findings on an MRI scan, abnormalities were subdivided into pituitary, infundibular and brain abnormalities (figure 2).

Pituitary abnormalities: Eighteen patients had anterior pituitary abnormalities (figure 3), 8 patients had posterior pituitary abnormalities, and 10 patients had infundibular changes.

Conclusions And Learning Points
Nearly half the children with isolated GHD had an abnormal MRI scan. The most frequent abnormality is pituitary hypoplasia, followed by infundibulum and then posterior pituitary abnormalities. One fifth had additional cranial anomalies; with 4 (5.6%) having a Chiari malformation. Chiari malformation in GHD is an uncommon but recognised association, and patients with this condition may need additional monitoring if given growth hormone treatment.