Currently $a = 2.400$, so

$$\mathbb{E}[Y_i^{2+\varepsilon}] < \infty,$$

but

$$\mathbb{E}[Y_i^{2.400}] = \infty.$$

The radii have second moments, so we choose $m = m(a)$ so that $\mathbb{E}[Y_i^2] = 1$.