The relationship between pubertal timing, pituitary volume, and depressive symptoms during adolescence

There is a link “between pubertal timing and depression”, with some studies showing that early puberty may “predict depressive symptom and disorders in girls” (Whittle et al, 2012, p. 882). “There is also some evidence that size of the pituitary gland is associated with pubertal timing and depression vulnerability” (p. 882). This study explored the relationships between the timing of puberty, pituitary volume and depression in adolescents.

Questionnaires and MRI scans were administered to 155 adolescents from Melbourne. Results showed that “there was a significant association between pubertal timing and baseline depressive symptoms... with earlier pubertal timing predicting higher symptoms. Earlier pubertal timing also predicted larger pituitary volumes... However, pituitary volume was not significantly associated with depressive symptoms” (p. 885). It was also revealed that earlier pubertal timing predicted higher depressive symptoms for girls.

The researchers concluded that there is “evidence that the volume of the pituitary gland mediates the relationship between early pubertal timing and increasing depressive symptoms across early to mid-adolescence. This finding suggests that neurobiological mechanisms are partly responsible for the link between early pubertal timing and adverse mental health outcomes in adolescents” (p. 889).

Overall, this study revealed that “an enlarged pituitary gland in adolescents with early pubertal timing might be associated with hyperactivation of the hormonal stress response, leading to increased susceptibility to environmental stressors, and subsequent development of depressive symptoms” (p. 881). These findings have implications for prevention and intervention strategies for depression in adolescence. Educators and medical professionals who recognise early-maturing adolescents, may find “that the stress system might be biologically hyperactive in these individuals, and as such interventions that seek to modulate emotional reactions once they are elicited might be less successful than those that seek to prevent or reduce environmental exposure to stressors among these individuals” (p.889).