

12. Gonadal - male

ALL PATIENTS

- 1) Pubertal staging six monthly, including testicular volume by orchidometer
- 2) Measure and chart height at least six monthly until normal pubertal growth spurt established
- 3) When appropriate, discuss need for contraception (even in presence of impaired fertility)
- 4) Semen analysis when appropriate

PRACTICE POINTS

- 1) Assessment of male pubertal development and fertility should include six monthly assessment of testicular volume using the Prader orchidometer, Tanner staging of secondary sexual development and 6-12 monthly measurement of serum FSH, LH, testosterone, inhibin B (if available) and semen analysis (when appropriate).
- 2) Refer to Endocrinologist if there is concern about:
 - Poor growth (see *Hypothalamic Pituitary Axis*)
 - Delayed pubertal development (see *Facts of Puberty*)
 - Risk of hypogonadism
- 3) With modern assisted reproductive technology (ART), in particular intra-cytoplasmic sperm injection (ICSI), a low sperm count should not preclude fertility
- 4) Fertility counselling should be provided to survivors of childhood cancer
- 5) Cryopreservation of semen before cytotoxic treatment should be considered for young male patients whose cancer therapy will include potentially gonadotoxic treatments

RISK FACTORS

- Radiotherapy to field including testes (including TBI)
- Alkylating agents:
 - BCNU
 - Busulphan
 - CCNU
 - Chlorambucil
 - Cyclophosphamide
 - Ifosfamide
 - Melphalan
 - Mustine
 - Nitrogen mustard
 - Thiotepea
- Cisplatin
- Cytarabine
- Dacarbazine
- Procarbazine

SUMMARY OF THE EVIDENCE

- There is a large volume of evidence that both prepubertal and postpubertal testes are susceptible to cytotoxic treatment by alkylating agents or radiotherapy to the gonads.
- Sertoli / germ cells are more susceptible than Leydig cells to chemotherapeutic or radiotherapeutic damage.
- Decreased testicular volume (≤ 10 ml) is associated with impaired spermatogenesis in the postpubertal male. Therefore testicular volume is not a reliable indicator of pubertal progression in this context. Testicular damage is also associated with elevated FSH and reduced serum inhibin B.
- Direct radiotherapy to the testes cause permanently impaired spermatogenesis and Leydig cell dysfunction.
- TBI causes permanently impaired spermatogenesis but has variable effects on Leydig cell function. Most prepubertal boys undergoing BMT with chemotherapy and hyperfractionated TBI can expect to progress normally through puberty.
- There is evidence for impaired spermatogenesis after treatment for childhood cancer but the sperm produced carries as much healthy DNA as sperm produced by the healthy population.

REFERENCES

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