Risk-benefit analysis attests to the importance of neonatal male circumcision to public health and individual well-being

Introduction

Evidence-based policy statements in the USA[1,2] and Australia[3] support circumcision, which is best done in the neonatal period.[4] A thorough risk-benefit analysis is, however, required.

Aim

To determine the overall medical benefit and risk of neonatal male circumcision.

Methods

PubMed searches by 'circumcision' and relevant keywords.

Results

Table 1 shows increase in risk of various medical conditions conferred by lack of circumcision. Together, benefits of circumcision exceeded risks by 100 to 1.[5] Over their lifetime 1 in 2 uncircumcised males will suffer a condition (some fatal) caused by retention of the foreskin.[5] A meta-analysis showed substantial protection against urinary tract infections, finding these affected 1 in 3 uncircumcised males over their lifetime.[6] The degree of protection was 10-fold in infancy when risk of kidney damage is greatest. Circumcision protects against phimosis, paraphimosis, balanitis, sexually transmitted infections (e.g., oncogenic HPV [an epidemic], HSV-2, Trichomonas, mycoplasma, chancroid, syphilis and HIV), thrush, inferior hygiene, penile cancer (that affects 1 in 1,000 uncircumcised males over the lifetime) and prostate cancer.[1,2,5]

Circumcision protects the female partner(s) from cervical cancer, bacterial vaginosis and STIs[1-5] (Table 1).

Risk of adverse events is 0.5%, virtually all being minor and immediately and easily treatable with complete resolution[1,2,5,7] (Table 1). Neonatal male circumcision is highly cost-effective.[8] There are no long-term adverse effects on sexual function, sensitivity or pleasure;[9] if anything sex is better. Legal and ethical considerations also support neonatal male circumcision.[10]

Conclusions

• The strong net benefit and low risk of neonatal male circumcision makes it comparable to childhood vaccination.

• Circumcision of baby boys should be offered routinely.

• Access should be facilitated and affordability assured by state and federal governments in the USA, UK, Australia and all other countries worldwide as an evidence-based public health imperative.

References

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*For specific refs to each condition see Ref 5.

TABLE 1. Comprehensive risk-benefit analysis of neonatal male circumcision (ref[5*])

Risks from not circumcising

Condition	Increase in risk (95% CI)	Rating of evidence	Percentage of uncircumcised affected
Urinary tract infections: age 0–1 year	**9.9** (7.5–13) Ref 6	1++	**1.3**
Urinary tract infections: age 1–16 years	**6.6** (3.3–13) Re f6	1++	**2.7**
Urinary tract infections: age >16 years	**3.4** (0.92–50) Re f6	1+	**28**
Urinary tract infections: lifetime	**3.6** (1.8–5.7) Ref 6	1+	**32**
Pyelonephritis (infants)	**10** Ref6	2+	**0.6**
– with concurrent bactaeremia	**20** Ref6	2+	**0.1**
– hypertension in early adulthood	–	2–	**0.1**
– end-stage renal disease in early adult	–	2–	**0.06**
Candidiasis (thrush)	**2.5** (1.7–3.7) Ref 5	2+	**10**
Prostate cancer	**1.2–2.0** Ref5	2+	**2–10**
Balanitis	**3.1** (1.9–5.0) Ref 5	1+	**10**
Phimosis	**100** 5	1++	**10**
High-risk HPV infection: RCT	**1.5** (1.1–2.0) Ref 5	1++	**6**
High-risk HPV infection: meta-analysis	**2.7** (1.2–6.3) Ref 5	1+	**10**
Herpes simplex virus type 2: RCT	**1.4** (1.0–2.5) Ref 5	1++	**4**
HSV-2: meta-analysis	**1.1** (1.0–1.3) Ref 5	1–	**1**
Genital ulcer disease	**2.0** (1.4–2.3) Ref 5	1+	**2**
Trichomonas vaginalis	**1.9** (1.0–3.6) Ref 5	1+	**0.5**
Mycoplasma genitalium	**1.8** (1.0–3.4) Ref 5	1++	**1**
Chancroid	**0.1–1.1** Ref 5	1++	**Low**
Syphilis	**1.9** (1.2–2.9) Ref 5	2+	**Low**
HIV (acquired heterosexually)	**2.4** (1.8–3.2) Ref 5	1++	**0.3**
Penile cancer (lifetime)	**>20** Ref5	1++	**0.1**
In female partner:			
Cervical cancer	**2.4** (1.3–4.3) Ref 5	2++	–
Chlamydia trachomatis	**5.6** (1.7–20) Ref 5	2+	–
Herpes simplex virus type 2	**2.2** (1.4–3.6) Ref 5	2+	–
Trichomonas vaginalis	**1.9** (1.0–10) Ref 5	1++	–
Bacterial vaginosis	**1.7** (1.1–2.6) Ref 5	1++	–

Thus risk to an uncircumcised male of developing a condition requiring medical attention over their lifetime = very approximately 1 in 2.

Risks associated with neonatal circumcision

Condition	Percentage affected Refs 1,2,5,7
Infection, local	0.2
Infection, systemic	0.02
Excessive bleeding	0.1
Need for repeat surgery (if skin bridges or too little prepuce removed	0.1
Loss of penis	0.0001
Death	0.000001
Loss of penile sensitivity	0

Thus risk of an easily treatable condition = approx. 1 in 200 and of a serious complication = 1 in 5000.

*****THUS BENEFITS EXCEED RISKS BY 100 TO 1*****