

Extraordinarily high rates of male circumcision in South Korea: history and underlying causes

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Objective To investigate the high circumcision rate in South Korea and its rapid increase in the short period since its introduction.

Subjects and methods From January to December 2000, 5434 South Korean males (or their parents) aged 0–92 years were interviewed in detail about their circumcision status, their age at circumcision, and the possible effect of circumcision on their sexuality. In addition, 267 practising medical doctors were surveyed about their basic understanding of circumcision and phimosis.

Results Currently the circumcision rate for high-school boys is >90% and for those >70 years old is <10%. The circumcision rate in 1945 was <0.1%. When averaged over the whole population, the present South Korean circumcision rate is ≈60%; the rate has increased dramatically with time and particularly in the past 20 years, when the estimated number of male circumcisions has exceeded the number of male births. Although circumcision in South Korea has been strongly influenced by American culture, it has never been predominantly neonatal. The age at circumcision has continued to decrease and boys are now circumcised at ≈12 years old. Of those who were circumcised long after they had been sexually active, >80% reported no noticeable difference in

sexuality, but a man was twice as likely to have experienced diminished sexuality than improved sexuality. Of the doctors who were surveyed, 41% carried out circumcision but, unlike in America, gynaecologists and paediatricians rarely did so. Among the doctors, basic knowledge on circumcision and phimosis was generally lacking, regardless of whether they practised circumcision or not. Amongst the factors contributing to the high circumcision rate was the mistaken notion held by both doctors and the general public that circumcision is directly correlated with industrialization and general progress of living standards. Many doctors believe the out-dated and sometimes controversial benefits of circumcision, i.e. prevention of cervical cancer and sexually transmitted diseases, and improved sexuality. Thus the vast majority of doctors recommend circumcision regardless of the patient's age. Peer pressure was also an important contributing factor.

Conclusion South Korea has an unusual history of circumcision. The mistaken and out-dated notions about circumcision and lack of knowledge of phimosis by physicians seem to be a leading contributory factor to the extraordinarily high circumcision rate.

Keywords circumcision, South Korea, history, phimosis

Introduction

Male circumcision is undertaken mostly for religious reasons, notably in Moslem and Jewish communities. Starting from the mid-19th century, circumcision began to be adopted in English-speaking countries but at present, only in the USA are half the boys circumcised. In other English-speaking countries the circumcision rate has been declining or is already fairly low [1,2], e.g. at ≈5.6% for England or ≈2% for New Zealand.

We recently reported that South Korea has a surprisingly high circumcision rate [3]; it is the only country

among its geographical and cultural neighbours in which most boys are circumcised. No other countries with strong Confucian and Buddhist traditions circumcise in this way. Indeed, circumcision is directly against Korea's long and strong tradition of preserving the body as it is given by his or her parents [3]. As Christianity has never been associated with circumcision throughout its 2000-year history, the recent popularity of Christianity in South Korea, both Protestant and Catholic, cannot account for the present situation either. There are virtually no Muslim and Jewish populations living in South Korea. Thus all circumcisions have supposedly been 'medical'. While an indirect American influence was evident in our previous study [3], it was

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unclear why South Korean circumcision has never been neonatal, in stark contrast with the practice in the USA.

As the supposed initiation of circumcision in South Korea is so well defined (1945–1950 [3]), it is the only country where the first generation of those who are circumcised and those practising circumcision are still alive. In the present study we investigated how the circumcision rate in South Korea increased so rapidly in such a short period and why it is so high.

Subjects and methods

The study included 5434 males (or their parents), aged 0–92 years, who were questioned as to whether and when they were circumcised; from this information we obtained the present rate with age, the rate as a function of the calendar year, and the mean age at circumcision vs age. The 712 men who were circumcised long after they had been sexually active were asked what the effect of circumcision was on their sex lives (whether it became better or worse).

In South Korea, most circumcisions are performed in local clinics by practising medical doctors; thus to determine how the present situation arose, 267 practising doctors were surveyed to ascertain their basic knowledge of and beliefs about circumcision and phimosis, whether they themselves were circumcised, and why they recommended circumcision.

Results

The number of interviewees in age groups is summarized in Fig. 1. Their present (year 2000) circumcision status is summarized in Fig. 2, in groups 5 years apart in median age. The circumcision rate is >90% for ≈18-year-olds and continues to decrease until it becomes <10% for those >70 years old. Circumcision is predominantly carried out long after birth, because <10% of infants are circumcised. There were no noticeable variations in circumcision rate with educational or economic background, geographical origin or where the survey was

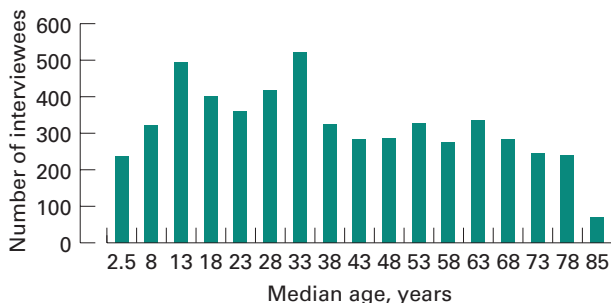


Fig. 1. The sample size as a function of the median age of the interviewees.

conducted. Also, older men had lower circumcision rates regardless of where the survey was conducted. The distribution of the circumcision rate was deduced for the same population in 1970, when the polled group was 30 years younger. The resulting distribution is also shown in Fig. 2. The peak circumcision rate in 1970 was in those aged ≈28 years, at 35%. Within 30 years the circumcision rate for 16-year-olds increased 20-fold; furthermore, the neonatal circumcision rate in 1970 was practically zero.

In the survey over 1400 males were born before 1945 but only one person was circumcised before then, the year of the start of the American trusteeship of South Korea. He was circumcised in 1943 and was a student of a medical school originally established by American missionaries. Therefore it can be concluded that, while there might have been isolated instances of circumcision before 1945, the vast majority of circumcisions occurred afterwards. The abrupt start of circumcision is shown clearly in Fig. 3, where each circumcised male amongst the interviewees is represented by a point whose horizontal and vertical locations indicate, respectively, his age and the year of his circumcision. Three things are apparent; circumcision started in 1945, mass circumcision began in the 1960s and circumcision has always been mostly after birth.

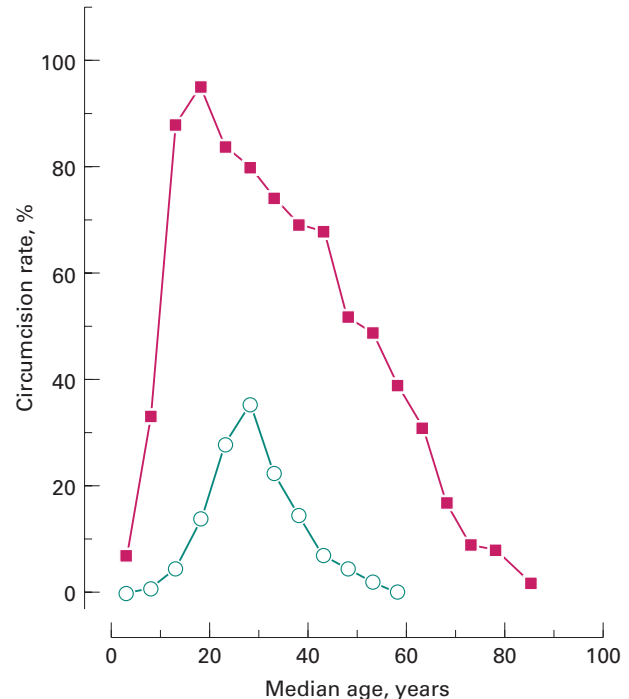


Fig. 2. The circumcision rate against the median age of the respondents (red squares, year 2000). From the history of the respondents the estimated circumcision rate against age for 1970 is shown by the green open circles.

Currently most boys are being circumcised at ≈ 12 years old; as shown in Fig. 4, the prevalent age of circumcision is 9–14 years. Also shown in Fig. 4 is the distribution of age at circumcision for those aged 45–50 years; the distribution is wider and the mean age at circumcision greater, at ≈ 27 years. Figure 4 suggests that the mean age at circumcision continued to decrease since circumcision started in 1945. Figure 5 shows the mean age at circumcision of circumcised males plotted against their present age. While circumcision is rare amongst older men aged > 70 years, they were circumcised on average after the age of 30 years.

Figure 6a shows the circumcision rate of then-20-year-old men as a function of the calendar year. Using Census Bureau data (<http://www.nso.gov.kr>) for

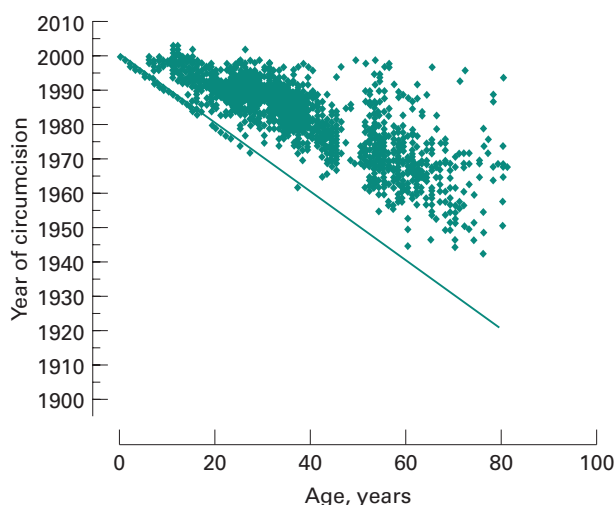


Fig. 3. Each circumcised male is represented by a point whose location indicates his age and year of circumcision. The abrupt start of circumcision is evident, as is the post-neonatal nature. The solid line represents the line of neonatal circumcision.

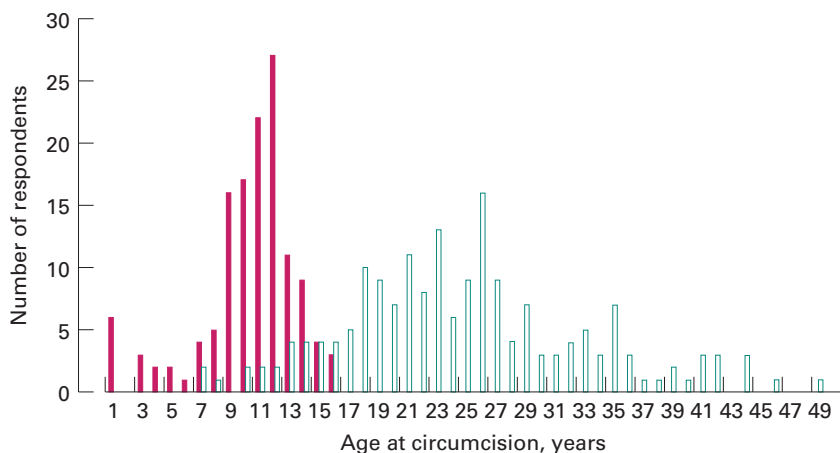


Fig. 4. The age at circumcision for 16–17-year-old (red bars) and 45–50-year-old circumcised men (green open bars).

the population structure over time, the circumcision rate averaged over the entire population was estimated for the last 50 years (Fig. 6b); the present estimated rate is $\approx 60\%$, whereas in 1960 it was $\approx 3\%$. The steepest increase in the rate was between 1980 and 1995, with the rate for the entire population increasing at $\approx 2.9\%$ per year between 1985 and 1995. With a birth rate of $\approx 1.5\%$ and death rate of $\approx 0.5\%$, the number of male circumcisions must have far exceeded the number of male births during this period. Considering the actual death rate of each age group with time, the number of circumcisions performed per year can be estimated; the results are shown in Fig. 7. As expected, the circumcision rate has been $> 100\%$ for the last 10–15 years.

More than 80% of the 593 men who were circumcised long after they had been sexually active reported no noticeable difference in sexuality, but a man reporting a change was twice as likely to have experienced diminished than improved sexuality (78 vs 41 respondents). The most common complaints were painful erections, resulting presumably from the removal of too much of the prepuce, and diminished sexual pleasure. A few respondents complained of penile curvature on erection.

Overall, 41% of the doctors polled (267) practised circumcision; the percentage in each speciality using circumcision was: urology (92%), general surgery (88%), general practice (80%), dermatology (80%), thoracic, orthopaedic and plastic surgery (72%), family physician (58%), anaesthesiology (50%), obstetrics and gynaecology (28%), and internal medicine (2%). No paediatricians reported using circumcision.

Of the doctors using circumcision, 72% were circumcised themselves (52 of 72). However, 56% of those who did not circumcise were circumcised themselves (49 of 88); this difference is statistically significant ($P < 0.05$). Of the two major circumcisers (urologists and general

surgeons) 91% were circumcised (31 of 34) and 92% practised circumcision. In sharp contrast, among inter-nists and paediatricians who rarely, if ever, practise circumcision, 51% were circumcised (20 of 39); these differences are also statistically significant ($P < 0.001$).

To analyse the doctors' perceptions of circumcision rate in developed and neighbouring countries, they were asked, using a multiple-choice format, what the approximate circumcision rates were in Scandinavian countries and which of South Korea's neighbouring countries routinely used mass circumcision; their answers are summarized in Table 1. For the circumcision rates in Scandinavian countries, more than half of the doctors believed that the rate was $> 50\%$. More than half of the polled doctors believed that Japan also had circumcision

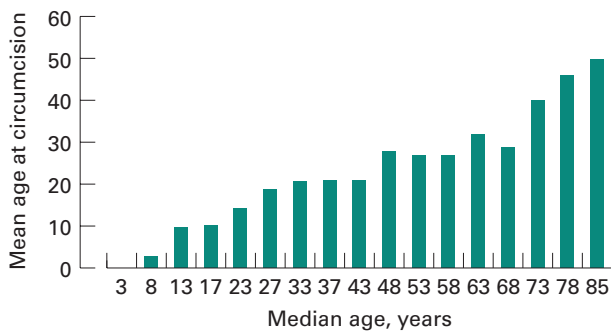


Fig. 5. The mean age at circumcision vs the median age of circumcised males.

rate of $> 50\%$. In contrast, only 8% of the doctors guessed that North Korea and China had a circumcision rate of $> 50\%$. There was no noticeable difference in doctors' perceptions depending on whether they used circumcision or not.

Two multiple-choice questions were also asked about phimosis (Table 1; which also summarizes the doctors' answers); $> 70\%$ of doctors defined phimosis as 'glans covered by foreskin', 'long foreskin', or 'foreskin itself'. Less than 30% offered the definition held by most doctors worldwide, i.e. an unretractable foreskin. On the second question, $> 75\%$ of doctors reported an astonishingly high percentage of phimosis ($> 40\%$), consistent with most of the polled doctors having the wrong definition of phimosis. Incidentally, of 267 polled doctors, only five answered all four questions correctly.

The vast majority of polled doctors (99%) recommended circumcision regardless of age; as to why they recommended universal circumcision, 75% of doctors cited 'prevention of cervical cancer'. Most of the same group of doctors also cited 'improved hygiene and prevention of sexually transmitted diseases'. Other than medical benefits, 18% of doctors cited parental request as the primary cause for their circumcising their patient.

Discussion

The history of circumcision in South Korea was examined by undertaking a large-scale detailed study

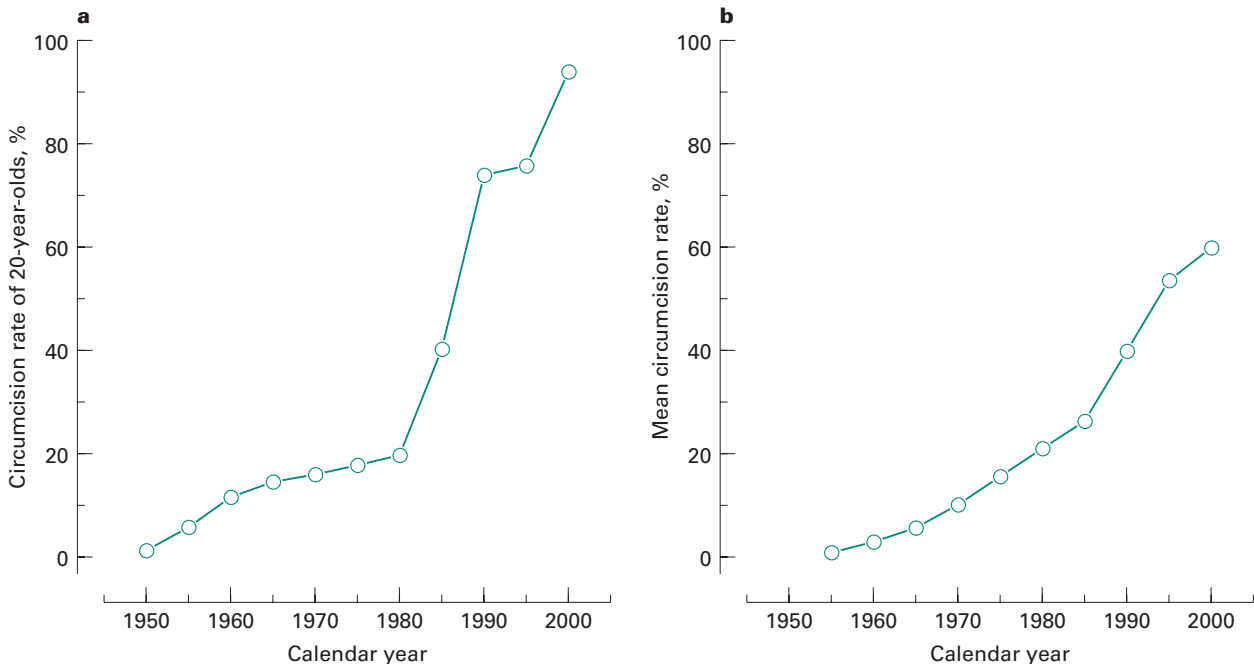


Fig. 6. **a**, The circumcision rate of then-20-year-olds among the respondents as a function of calendar year. **b**, The estimated circumcision rate averaged over the whole population as a function of calendar year (from South Korean Census Bureau Data).

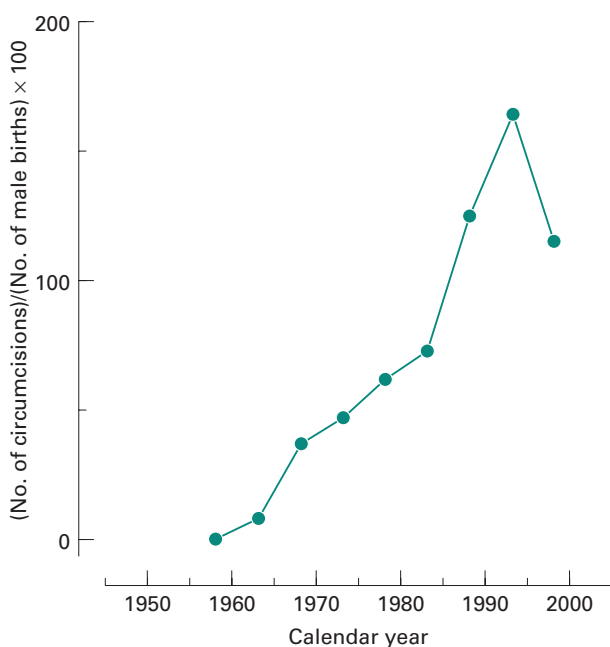


Fig. 7. Estimated number of circumcisions divided by number of male births, plotted against the calendar year. During the 1980s and 1990s, the number of circumcisions exceeded the number of male births (giving a circumcision rate of >100%). The decrease in the number of circumcisions between 1995 and 2000 should not be interpreted as a decline in the rate of circumcision but as a sign that most of the older men who would have been circumcised were so already. The circumcision rate would be expected to saturate at $\approx 100\%$ in the future.

of >5000 males of all ages up to 92 years, and by questioning 267 practising medical doctors about their basic understanding of circumcision. While this survey was mostly conducted in Seoul, this population comprises about half of the general population, most of whom originate from elsewhere. Therefore, it can be assumed that the interviewees are generally representative of the general population of South Korea.

Circumcision in South Korea is unique in several aspects; while most young males are being circumcised for 'medical' and not for religious reasons, unlike medical circumcision in the USA, <10% of circumcision is neonatal; interestingly, there is no fixed age for circumcision in South Korea. Older men were circumcised when they were older. The dramatic increase in circumcision rate in the short period since circumcision started in 1945 is unprecedented in modern medical history; the mean estimated circumcision rate over the population is $\approx 60\%$, whereas it was $\approx 3\%$ in 1960. The circumcision rate in young males is high, at >90% for those aged ≈ 18 years. Circumcised boys are the majority and thus boys who resist circumcision until later often face many years of peer and psychological pressure. The circumcision rate has been >100% of male births

Table 1 The questions used to assess the perception of South Korean doctors about circumcision and phimosis; the bold typeface indicates correct answers

Question	Response, %
<i>Circumcision</i>	
What is the circumcision rate in Sweden and Denmark?	
$\approx 90\%$	21.7
$\approx 50\%$	31.1
$\approx 10\%$	37.5
1–2%	9.7
Which of the South Korea's neighbouring countries, including South Korea, have >50% circumcision rate?	
South Korea, North Korea, Japan, and China	7.9
Only in South Korea and Japan	51.7
Only in South Korea	40.0
Only in South Korea and North Korea	0
<i>Phimosis</i>	
What is physiological phimosis?	
Prepuce itself	4.1
Unretractable foreskin	28.8
Glans is covered by prepuce	56.9
Prepuce is too long	10.1
What is the percentage of phimotic males at ≈ 20 years old?	
>90%	12.4
$\approx 70\%$	37.1
$\approx 40\%$	34.5
$\approx 2\%$	16.1

for the last 15 years. We cannot explain this large increase, even if it is assumed that every boy who is born is circumcised and that every male who dies is uncircumcised. Therefore, the number of male circumcisions must have been far exceeding the number of male births during this period.

As circumcision in South Korea has never been predominantly neonatal, most circumcisions were of boys, adolescents and adults. Currently, as the age at circumcision continues to decrease with time, there can be a situation whereby a father and son, who are 30 years apart in age, were circumcised 15 years apart. Consistent with this there were among the interviewees three generations of males circumcised within 20 years. Indeed, there were a few grandfathers amongst the interviewees who were circumcised after their sons and grandsons, after being urged to do so by their sons and daughters-in-law. The main reason for these 'elderly' circumcisions was mostly peer-pressure; circumcised sons and their wives somehow felt ashamed of their uncircumcised fathers. Added to such peer pressure has been the 'culture of public bath-houses'. Most South Korean men often go to public bath-houses and uncircumcised men tend to feel embarrassed.

Male circumcision removes 33–50% of the penile skin, and nearly all of the penile fine-touch

neuroreceptors [4]. While there has been debate over whether circumcision affects the sexual sensation of the penis, there have been few relevant studies. Studies on circumcision and sexuality were mostly in neonatally circumcised males [5,6]; little difference was found in sexuality in these studies. However, there is a widespread perception in South Korean society that circumcision is good for sex, i.e. the prevention of premature ejaculation and prolonging of intercourse [3]. How these perceptions may have affected the responses of the present interviewees is difficult to gauge. While the present study does not answer the larger question of circumcision and sexuality, South Korea offers a unique opportunity to study the effect of circumcision on sexuality, as millions of men were circumcised long after they had been sexually active. In the present study, >80% reported no noticeable difference but a man reporting a change was twice as likely to have experienced diminished than improved sexuality. While the reasons for complaints were specific, those who responded that their sex lives improved after circumcision were less specific; no details were given about how and why their sex lives improved.

The results obtained from the 267 South Korean doctors surveyed were helpful in understanding how a traditionally Confucian country has adopted widespread circumcision in one generation. No paediatricians and relatively few gynaecologists practised circumcision; this contrasts with the situation in the USA where most circumcisions are neonatal and conducted by these groups [7]. More than half of the doctors surveyed believed that the circumcision rate in Scandinavia was >50%; this perception is of course wrong, as the circumcision rate there is 1–2% [8]. The possible source of this error is the belief that most males in any medically and economically advanced countries, like the USA, should be routinely circumcised. More interestingly, more than half the South Korean doctors also considered that Japan used routine male circumcision; in reality, only South Korea among its neighbours practises routine circumcision. What is striking is that none of the doctors considered that North Korea uses mass circumcision. Therefore, it is clear that most South Korean doctors believe in the strong correlation between economic prosperity, medical advance and circumcision. They tend to think that prosperous countries such as Scandinavia and Japan should be using routine circumcision, while the generally poor North Koreans or Chinese do not. This erroneous yet strong belief in this direct correlation must be important in South Korean doctors recommending indiscriminate male circumcision; mass circumcision is viewed as part of 'advancement'.

Phimosis is generally defined as an 'unretractable foreskin'; the percentage of phimotic males at \approx 20 years

of age varies depending upon the study, but is 0.8–1.5% [9–11]. These males are prime candidates for medical circumcision in most countries outside the USA. In South Korea, >70% of doctors defined phimosis incorrectly and >75% believed that the incidence of phimosis was >40%. Most of the doctors surveyed recommended circumcision (99%); as South Korean doctors define circumcision as a 'phimosis operation', and as they believe that most adult males have phimosis, indiscriminate circumcision regardless of patient age seems obvious.

The reasons given by most doctors recommending universal circumcision were 'prevention of cervical cancer' and 'improved hygiene and prevention of sexually transmitted diseases'. Preventing cervical cancer by circumcision is now an outdated notion, as recent American Association of Paediatricians and American Cancer Society reports unequivocally note [12,13]. Circumcision has been suggested as an effective method of maintaining penile hygiene, but there is little evidence to affirm the association between circumcision status and optimum penile hygiene. There is no clear evidence that circumcision prevents sexually transmitted diseases. The only consistent trend is that uncircumcised men are more susceptible to genital ulcer disease, while circumcised men are more prone to urethritis [14]. Recently, there have been reports on the possible correlation between HIV infection and circumcision status [15–17]. Most of these articles were based on research in African males with generally poor hygiene, and the potential preventive measure of circumcision against HIV infection was not intended to be applied to developed countries. However, these results have often been quoted as one of the main causes of the low incidence of HIV infection among South Korean males, and another reason for recommending universal circumcision. These recommendations probably stem in part from South Korea's general unawareness that Japanese males are mostly uncircumcised, yet they also have a similarly low incidence of HIV infection.

Recent articles [12,18–20] on UTI suggest that even though the incidence of UTI may be less in circumcised boys, it almost always occurs in the first year of life; it is also rare (<1 in 100) and easily treatable with antibiotics. However, in South Korea these same articles are quoted or interpreted as recommending universal circumcision not at infancy but at, say, 12 years of age, which in reality has no bearing on preventing UTI.

In conclusion, male circumcision started 50 years ago in South Korea but now the country has one of the highest male circumcision rates in the world. The mistaken and outdated notions of South Korean doctors about circumcision, and their lack of knowledge about

phimosis, seem to be a leading contributory factor to the extraordinarily high rate of circumcision.

Acknowledgements

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