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High Incidence of Urinary Cancer in the Blackfoot Disease Endemic Area in Taiwan

Key Words

Urinary cancer
Blackfoot disease
Endemic area
Arsemic cancer
Urinary caroinogen

ABSTRACT

A high incidence of urinary cancers including the transitional cell carcinoma of the kidney, ureter and urinary bladder, was observed in a rural area on the southwest coast of Taiwan called "blackfoot disease" (BFD) endemic area since 1980s. This article reviews recent studies of urinary cancer in the BFD endemic area, specially focus on an epidemiological investigation, causative factors exploration, clinicopathological evaluation, molecular research, and future prospectives.

In a rural area on the southwest coast of Taiwan, "blackfoot disease" (BFD) has been known as an endemic peripheral vascular disease for more than 60 years.¹ Likewise, a high prevalence of cancer of the urinary tract in that area was also observed. In 1979, a higher crude mortality rate of bladder cancer in the BFD endemic area than in the general population of Taiwan was reported with statistical significance.² Clinically, according to reports of a urologist in southern Taiwan, most of the patients urothelial cancer came from this endemic area of BFD.³ Among all tumors of the kidney, the percentage of renal pelvic tumor was also unusually high (57.6% to 83.3%) in this area.⁴ A high incidence of cancer of the urinary tract was also demonstrated by a hospital-based retrospective study. The relative risk of transitional cell carcinoma of the kidney, ureter, and bladder in the endemic area of BFD was 61, 54, and 37 times that of the general population, respectively.⁵ This paper reviews recent studies of urinary cancer in the BFD endemic area, with particular focus on an epidemiological investigation, causative factors exploration, clinicopathological evaluation, molecular research, and fu-

ture prospectives.

Surveys of High Incidence of Urinary Cancer in the BFD Endemic Area

Several comprehensive surveys concerning the high incidence of urinary cancer in BFD endemic area have been undertaken in recent years. A statistical analysis of cancer mortality rates in Taiwan from 1968 to 1982 was performed, and compared with the general population in Taiwan, the standardised mortality ratio (SMR) for cancer of the bladder and kidney in this locality was 1100 and 772, respectively, for males and 2009 and 1119, respectively, for females.⁶ The high incidence of bladder cancer in the BFD endemic area of Taiwan was also evident from statistical estimation of annual records. There are considerable differences in the incidence rates of bladder cancer in different populations, and they can be classified into areas of high incidence (male > 20, female > 5/100,000), medium incidence (male < 10-20, female 2-5), and low incidence (male < 10, female < 2). In comparison with other populations, the Chinese race has a medium to low incidence of bladder cancer (male 3.3-