Summary

This study aimed to identify the prevalence of some extended spectrum β-lactamase (ESBL) enzymes in *Escherichia coli* and *Klebsiella* spp. isolated from colon and bladder cancer patients by using the phenotypic and molecular techniques. A total of 61 stool (n=28) and urine (n=33) samples collected from 61 patients definitely and clinically diagnosed with cancer that attended to Al-Diwaniya Teaching Hospital during the period from November 2010 to April 2011.

Primary culturing on MacConkey agar revealed that: out of 61 samples only 49 (80.3 %) gave positive growth as follow: out 33 samples, only 23 (69.7 %) of urine of patients with bladder cancer were positive for culture and showed significant bacteriuria ($>10^2$ CFU\ml). While in the case of colon cancer patients, out of 28 samples, the results showed that 26 (92.8 %) of stool were positive for culture. The study revealed that *Klebsiella* species and *E. coli* were the most common isolated species as compared with others, they were detected in 17 (73.9 %) from urine samples, and 19 (73 %) from stool samples.

The results showed that the vast majority of isolates were found to be resistant to ß-lactam antibiotics (ampicillin and amoxicillin) in the primary screening test at percentage 19 (86.4 %) out of 22 *E. coli* isolates and 13 (92.8 %) out of 14 *Klebsiella* spp. Subsequently, all the 32 β-lactam resistant isolates were screened for their antibiotic resistance against 18 antibiotics of different classes using Kirby-Bauer disk diffusion method. The results showed that all the tested isolates were resistant to at least three classes of antibiotics to which they were tested, hence the isolates are considered to be multidrug resistant.

All the 32 β-lactam resistant *E. coli* and *Klebsiella* spp. isolates were detected for β-lactamase production firstly by using rapid iodometric method, the results revealed that out of 19 β-lactam resistant *E. coli* isolates only 11 (57.9 %) and out of 13 β-lactam resistant *Klebsiella* spp. isolates only 8 (61.3 %) were positive. On the basis of cefinase disc method, the results revealed that out of 19 *E. coli* isolates, only 9 (47.4 %) and out of 13 *Klebsiella* spp. isolates, only 6 (46.2 %) were able to produce these enzymes.

In the present study, 20 (62.5 %) of the 32 β-lactam resistant isolates were detected as potential ESBL-producers in the initial screening test which 12 (63.2 %) *E. coli* and 8 (61.5 %) *Klebsiella* spp. were positive, while in the confirmative detection of ESBL by double disk synergy test, the results showed that out of 32 β-lactam resistant *E. coli* and *Klebsiella* spp. examined in this study, ESBLs were detected in 9 (28.1 %) isolates, they are distributed as 4 (21.1 %) isolates belonging to *E. coli* and 5 (38.5 %) isolates belonging to *K. pneumoniae* subsp. *pneumoniae*.

The minimum inhibitory concentrations (MIC) of three β-lactam antibiotics (amoxicillin, cefotaxime, and ceftriaxone) were determined to these ESBL-producers by using Hicomb test strips.

The nine ESBLs-producers were submitted to molecular detection of ESBL genes (bla_{TEM}, bla_{SHV}, bla_{CTX-M}, and bla_{OXA}) by using PCR technique. The results showed that all the tested ESBL producing isolates were carried at least one of the above mentioned ESBL genes. CTX-M was the most prevalent gene in the tested isolates at percentage (77.8 %) followed by SHV and OXA (66.7 %) for each, TEM came at end with (55.6 %).