COMORBIDITIES ASSOCIATED WITH URINARY TRACT INFECTION BY POSITIVE ESCHERICHIA COLI BLEE, IN INTERNAL MEDICINE SERVICE, ATE VITARTE HOSPITAL. 2017 - 2018

COMORBILIDADES ASOCIADAS A INFECCIÓN DE TRACTO URINARIO POR ESCHERICHIA COLI BLEE POSITIVO DEL HOSPITAL VITARTE. 2017 - 2018

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ABSTRACT

Introduction: The infections by bacteria producing b-lactamasas extended spectrum (ESBL) are a serious problem in our country since the beginning of the year 2000 there has been a progressive increase in the frequency of infections caused by these bacteria, especially Escherichia coli and Klebsiella spp. **Objective:** To determine the comorbidities associated with patients with Urinary Tract Infection caused by e. colli BLEE of the Internal Medicine Service in the Vitarte Hospital in the period 2017-2018. **Methods:** Observational, case-control study. There was a sample corresponding to 114 divided into 57 cases and 57 controls. The information was collected through the review of medical records and the use of a data collection form. Descriptive statistics were used with measures of central tendency and dispersion, in the bivariate analysis the logistic regression, and in the multivariate analysis generalized linear models. **Results:** The median age of the population was 66.5 RI: 19-97 years, being 79.82% female (n = 23) and 46.49% mestizo (n = 53). In reference to those who had E. Coli BLEE, their age had a median of 64 years with RI: 19-97, and 43.48% (n = 10) of male sex had it as did 63.64% (n = 4)) of those who had urinary obstruction, 55.56% (n = 5) of those who had urinary incontinence, 61.02% (n = 36) of those who had diabetes mellitus, 65% (n = 13) of the obese, 57.14% (n = 32) of the hypertensive patients and 62.71% (n = 32) of those who had recurrent UTI. It was determined in the bivariate analysis that DM (OR: 2.53, CI: 1.19-5.39, p = 0.016) and recurrent UTI (OR: 2.94, CI: 1.37-6.3, p = 0.005) were significant. In the multivariate analysis those who had recurrent UTI had 1.61 times the probability of having UTI of E. coli ESBL than those who did not have recurrent UTI with HF: 1.07-2.43, p = 0.022 adjusted for diabetes mellitus. **Conclusion:** Diabetes mellitus and recurrent UTI were comorbidities independently associated with UTI E. Coli BLEE, with recurrent UTI associated multivariate comorbidity adjusted for diabetes mellitus.

Key words: Urinary Tract Infection; Escherichia coli; EEBL; Diabetes Mellitus. (source: MeSH NLM)

RESUMEN

Introducción: Las infecciones por bacterias productoras de β-lactamasas de espectro extendido (BLEE) son un serio problema en nuestro país desde principios del año 2000 se ha dado un aumento progresivo en la frecuencia de las infecciones causadas por productoras de β-lactamasas de espectro extendido (BLEE). **Objetivo:** Determinar las comorbilidades asociadas a pacientes con Infección del Tracto Urinario causada por E. coli BLEE del servicio de medicina interna en el Hospital de Vitarte en el periodo 2017-2018. **Métodos:** Estudio observacional, analítico de tipo casos y controles. Se contó con una muestra correspondiente a 114 divididos en 57 casos y 57 controles. Se recolectó la información mediante la revisión de historias clínicas y el uso de una ficha de recolección de datos. Se utilizó estadística descriptiva con medidas de tendencia central y dispersión, en el análisis bivariado la regresión logística, y en el análisis multivariado modelos lineales generalizados. **Resultados:** La mediana de la edad de la población fue de 66,5 RI: 19-97 años, siendo de sexo femenino el 79,82% (n=23) y de raza mestiza el 46,49% (n=53). En referencia a los que tuvieron E. Coli BLEE, su edad tuvo una mediana de 64 años con RI: 19-97, y el 43,48% (n=10) del sexo masculino la tuvo al igual que el 63,64%(n=4) de los que tuvieron obstrucción urinaria, 55,56%(n=5) de los que tuvieron incontinencia urinaria, 61,02% (n=36) de los que tuvieron diabetes mellitus, 65%(n=13) de los obesos, 57,14%(n=32) de los hipertensos y 62,71% (n=32) de los que tuvieron ITU recurrente. Se determinó en el análisis bivariado que DM (OR:2,53, IC:1,19-5,39, p=0,016) e ITU recurrente (OR:2,94, IC:1,37-6,3, p=0,005) fueron significativos. En el análisis multivariado aquellos que tuvieron ITU recurrente tuvieron 1.61 veces la probabilidad de tener ITU E. Coli BLEE que los que no tuvieron ITU recurrente con IC:1,07-2,43, p=0,022 ajustado por diabetes mellitus. **Conclusión:** La diabetes mellitus y la ITU recurrente fueron comorbilidades independientemente asociadas a la ITU E. coli BLEE, siendo la ITU recurrente la comorbilidad asociada de forma multivariada ajustada por diabetes mellitus.

Palabras clave: Infección Tracto Urinario; Escherichia coli; BLEE; Diabetes Mellitus. (fuente: DeCS BIREME)

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INTRODUCTION

Urinary tract infections, known as UTIs, are considered worldwide as one of the most frequent reasons for medical consultations[1], presenting according to the WHO an incidence of 2-3 cases per 100 thousand inhabitants per year, generating high costs and burden for health systems worldwide[2]. In 90% of UTIs, the related etiological agent is Escherichia coli; however, this does not exclude the existence of a wide range of related pathogens[3]. Self-medication considered a public health problem at present, and its direct consequences on microbial resistance have generated a negative impact on the problem[4], together with the patient's comorbidities that can depress his immune system making it much more susceptible than normal to bacterial infection[5]. For example, the direct consequence of the indiscriminate use of third-generation cephalosporins brought as a consequence, first in Europe and then in the world, the Beta Lactamase of Extended Espectrum producing bacteria, called BLEE[5], whose participation in infections is increasing according to different reports in Latin America[4].

METHODS

Observational, transversal analytical study. Eligibility criteria were for the inclusion of patients with UTI and E. coli Blee positive confirmed with culture, and complete clinical history. In the controls, it was had, to the E. Coli BLEE negative. Exclusion criteria were pregnant patients, under 18 years old, polymicrobial urine cultures, and nosocomial UTI. There was a sample corresponding to 114 divided into 57 ITU BLEE and 57 non-ITU BLEE. The information was collected through the review of clinical records from randomized sampling and the use of a data collection form. Descriptive statistics were used with measures of central tendency and dispersion. In the bivariate analysis, the logistic regression, and the multivariate analysis generalized linear models.

RESULTS

We counted on clinical histories of 114 patients, divided in 57 exposed with ULE E. coli BLEE and 57 not exposed with sensitive E. coli UTI. The median age was 66 years,

with an interquartile range of 19 to 97 years. The sex was mostly female with 79.82% (n = 91) and the mestizo race 46.49% (n = 53).

Table 1 shows the description of each variable around the dependent variable E. coli sensitive Blee positive. In this case, those who had UTIs sensitive to E. coli ESBL had the following data: an age of 64 years with RI: 19.97, 51.65% (n = 47) were women, 53.83% (n = 28) of the mestizos, 48.54% (n = 50) of those who did not have Urinary Obstruction, 49.52% (n = 52) of those who did not have urinary incontinence, 61.02% (n = 36) of those who had diabetes mellitus, 46.81% (n = 44) of those who did not have obesity, 57.14% (n = 32) of those who had high blood pressure (HBP) and 62.71% (n = 37) of those who had recurrent UTI. For additional data, review table 1.

For the bivariate analysis, the differences between categories were analyzed, being the case that those whose statistical tests gave as results $p < 0.05$ would be significant and therefore, they would indicate that there are differences between categories and these are due to chance. Student's test (Normal) and U Mann Whitney (Not normal) were used for quantitative variables according to the type of distribution. For the qualitative variables, chi2 and Fisher tests were used according to the expected values. After this analysis, only the variables diabetes mellitus and recurrent UTI were significant with $p = 0.015$ and $p = 0.005$, respectively. Using the logistic regression, it was obtained that: those who had diabetes had 2.53 times the probability of having ULEE E. coli compared with those who did not have diabetes (CI: 1.19-5.39, $p = 0.016$), and those who had recurrent UTI they had 2.94 times the probability of having sensitive E. coli UTI compared with those who did not have recurrent UTI (CI: 1.37-6.3, $p = 0.005$). Being significant, both variables were analyzed in a multivariate manner. See Table 2

About the multivariate analysis, generalized linear models with a binomial distribution and logistic function were used to analyze positive BLEE UTI and DM and recurrent UTI. We found that recurrent UTI is associated with positive ESBL UTI: those who had recurrent UTI

Table 1. Characteristics of the variables according to E. Coli Sensitive BLEE positive.

	E. Coli Sensible		
	No Blee	**Si Blee**	**p**
Age	69 RI: 19,93	64 RI: 19-97	0,2133
Sex			
Female	44 (48,35)	47 (51,65)	
Male	13 (56,52)	10 (43,48)	
Race			0,755
Black	13 (56,52)	10 (43,48)	
White	19 (50)	19 (50)	
Mixed	25 (47,17)	28 (52,83)	
Urinary Obstruction			0,341
No	53 (51,46)	50 (48,54)	
Yes	4 (36,36)	7 (63,64)	
Urinary incontinence			
No	53 (50,48)	52 (49,52)	
Yes	4 (44,44)	5 (55,56)	
Mellitus diabetes			0,015
No	34 (61,82)	21 (38,18)	
Yes	23 (38,98)	36 (61,02)	
Obesity			0,14
No	50 (53,19)	44 (46,81)	
Yes	7 (35)	13 (65)	
Arterial hypertension			0,134
No	33 (56,9)	25 (43,1)	
Yes	24 (42,86)	32 (57,14)	
Recurrent UTI			0,005
No	35 (63,64)	20 (36,36)	
Yes	22 (37,29)	37 (62,71)	
IMC	25,01 DS: 3,94	25,45 DS:4,42	0,577PA
PA Systolic	120 RI: 85-184	130 RI: 100-170	0,413
PA Diastolic	70 RI: 50-100	80 RI: 51-100	0,531

Table 2. Bivariate analysis of the UTI E. Coli Sensitive BLEE positive.

	ITU e. Coli Sensible		
	RPc	**IC**	**p**
Mellitus diabetes	2,53	1,19 - 5,39	0,016
Recurrent UTI	2,94	1,37 - 6,3	0,005

Table 3. UTI multivariate analysis E. coli Sensitive BLEE positive

	ITU e. Coli Sensible		
	Rpa	**IC**	**p**
Mellitus diabetes	1,47	0,99 - 2,19	0,055
Recurrent UTI	1,61	1,07 - 2,43	0,022

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DISCUSSION

Urinary tract infections are one of the most prevalent infections6, being the second cause of community-acquired infection and the leading cause of nosocomial infection7. In the present study, it is evident that the highest frequency of UTI was female, in a percentage of 79.82% (n = 91). It contrasts the frequency of female sex found in this study, with the frequency in the Hospital Nacional Dos de Mayo - Peru in 2015, where the frequency of UTI due to ESBL bacteria is more than 60%8. Another study in Spain also finds the female population frequent for UTIs by ESBL agents. In a study conducted in Chile, where patients with diabetes mellitus are studied, it is found that the highest frequency is in women (52%)9. This frequency in women is due to the presence of microorganisms, that arrive via hematogenous or lymphatic routes, where it is shown that the microorganisms ascend towards the urethra (being this the most common route that leads to a urinary infection); being the most frequent agent E. Coli, (4 Among the most frequent comorbidities, Diabetes mellitus was found, with a higher proportion of crops being presented by e. ESBL coli positive, with a percentage of 61.02% (n = 36); which contrasts in a study at the Hospital de San José in the year 2017.[10]. Another study at the Hospital Augusto Hernández Mendoza, points out 63% of the common comorbidities like diabetes mellitus.[11] Regarding recurrent UTI in frequency with 62.71%. In a study in Tacna - Peru in 2016, previous or recurrent UTI (52%) 4 was found to be a risk factor, the present study of patients with ESBL coli culture positive with recurrent UTI in frequency with 62.71%. Also, in the research carried out at the Hogar Clínica San Juan de Dios - 2016, was observed

among the most frequent risk factors for prior UTI5. In addition, in a study conducted in Chile on the risk factors associated with UTI, it is found that comorbidity frequent is the recurrent UTI being in a 30.99.

Concerning age, in this study, the average age of presentation of the UTIs by E. coli ESBL is 64 years, in agreement with two studies conducted in Peru. One of them was made at the Hospital Nacional de la Policía (Lima) 12 and the Hospital Augusto Hernández Mendoza (Ica), where the affected age group was over 65 years old[11].

CONCLUSION

There are comorbidities associated with patients with Urinary Tract Infection caused by E. coli Blee positive from the Internal Medicine Service at Hospital de Vitarte in the period 2017-2018: Diabetes Mellitus and recurrent UTI are associated. No association was found for obesity or arterial hypertension.

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