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¿TIENE UTILIDAD EL PROBIÓTICO EN LA PREVENCIÓN DE INFECCIONES EN EL ÁMBITO HOSPITALARIO?

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Índice de la presentación.

Probióticos para la prevención de infecciones en general.

Probióticos para prevenir infecciones con origen intestinal.

- CDI
- Enterobacterias productoras de carbapenemasas.
  - Experiencia con probióticos (Vivomix)
  - FMT.

Utilización de probióticos en profilaxis.

ITU en mujeres y en niños
Neumonía asociada a ventilación mecánica
Infección respiratoria.
Sepsis.
Infección postquirúrgca
Infección nosocomial.

Effects of Probiotics on Necrotizing Enterocolitis, Sepsis, Intraventricular Hemorrhage, Mortality, Length of Hospital Stay, and Weight Gain in Very Preterm Infants: A Meta-Analysis. Sun J, Marwah G, Westgarth M, Buys N, Ellwood D, Gray PH. Adv Nutr. 2017 Sep 15;8(5):749-763

Probiotic and synbiotic therapy in critical illness: a systematic review and meta-analysis. Manzanares V et al. Crit Care 2016 Aug 19;19:262.

The efficacy of probiotics in prevention of urinary tract infection in children: A systematic review and meta-analysis. Hosseini M et al. J Pediatr Urol. (2017)

Schwenger EM, Tejani AM, Loewen PS Probiotics for preventing urinary tract infections in adults and children. Cochrane Database Syst Rev 2015.

Infección por *Clostridium difficile* (CDI)

Timely use of probiotics in hospitalized adults prevents Clostridium difficile infection: a systematic review with meta-regression analysis. NT, Maw A, Tmanova LL, Pino A, Ancy K, Crawford CV, Simon MS, Evans AT. Gastroenterology. 2017 Jun;152(8):1889-1900

19 trials randomizados.
Probiótico es eficaz en la prevención de CDI en pacientes hospitalizados que reciben antibiótico.
Eficacia significativamente superior cuanto más próximo se administre al inicio del antibiótico (3 primeros d).

Cost-Effectiveness Analysis of Probiotic Use to Prevent Clostridium difficile Infection in Hospitalized Adults Receiving Antibiotics Nicole T. Shen et al. Open Forum Infectious Diseases 2017Jul 22;4(3).

Coste efectivo en grupos poblacionales >65 años (>85 años).
Incidencias altas de CDI.
L. acidofilus + L. casei > S. boulardii.
Administrado al inicio del antibiótico (3 primeros d).

Estudios de coste/eficacia. CDI.

Nicole T. Shen et al. Cost-Effectiveness Analysis of Probiotic Use to Prevent Clostridium difficile Infection in Hospitalized Adults Receiving Antibiotics. Open Forum Infectious Diseases 2017Jul 22;4(3).

Lenoir-Wijnkoop I, Nuijten MJ, Craig J, Butler CC. Nutrition economic evaluation of a probiotic in the prevention of antibiotic-associated diarrhea. Front Pharmacol 2014; 5:13.

Leal JR, Heitman SJ, Conly JM, et al. Cost-effectiveness analysis of the use of probiotics for the prevention of Clostridium difficile-associated diarrhea in a provincial healthcare system. Infect Control Hosp Epidemiol 2016; 37:1079–86.

Infección por *Clostridium difficile* (CDI)

Heterogeneidad:

1) Diferentes probióticos.

2) Diferentes composiciones.

3) Distintas dosis.

4) Duración variable.

5) Diferentes tratamientos antibióticos (distinto efecto sobre la microbiota intestinal).

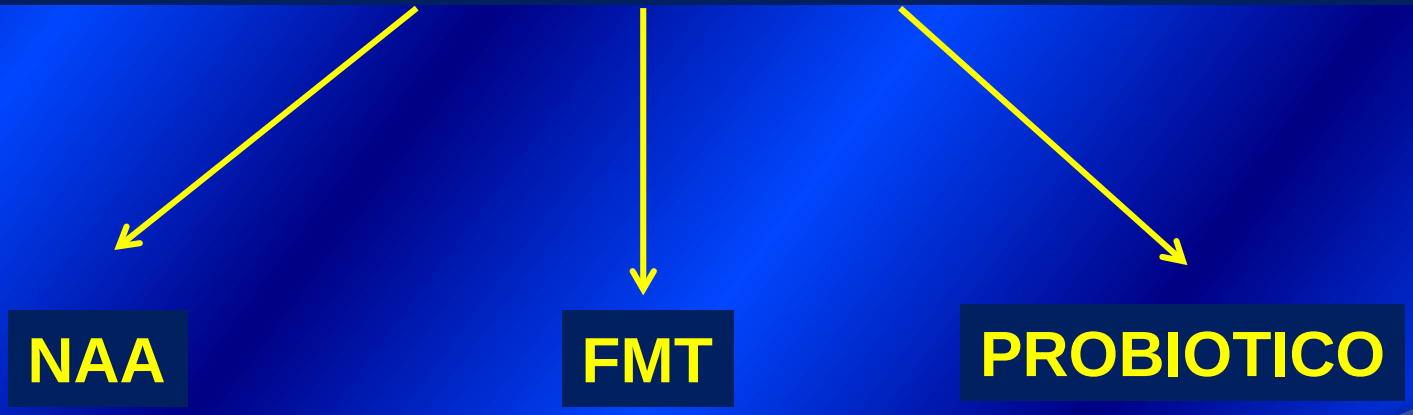
6) Prevalencia de la infección en el grupo poblacional estudiado.

Enterobacterias productoras de carbapenemasas.

Descolonización vs DISMINUCIÓN DEL INÓCULO.

Disminuir la transmisión

Disminuir la probabilidad de traslocación e infección.



Factors associated with short-term eradication of rectal colonisation by KPC-2 producing *Klebsiella pneumoniae* in an outbreak setting

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29th ECCMID European Congress of Clinical Microbiology and Infectious Diseases
Amsterdam, Netherlands
13 – 16 April 2019

Background.

KPC-producing *Klebsiella pneumoniae* is an increasing threat for patients admitted to healthcare institutions.

It is known that eradication reduces infection rates.

Eradication using non-absorbable oral antibiotic and probiotic is controversial.

There are no standard guideline about the composition of non-absorbable oral antibiotic and the duration of the treatment to guarantee the eradication.

An outbreak of KPC-2 occurred in Summer 2018 in Hospital Clinic Barcelona (750-bed university center).

Objetives.

The study aim was to assess the factors associated with eradication of rectal carriage during an outbreak of KPC-2 producing *Klebsiella pneumoniae* with an special emphasis on the role of a non-absorbable oral antibiotic regimen and a probiotic.

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Material and Methods

Prospective observational study from July to October 2018 in an outbreak setting.

Patients with a positive rectal swab for KPC-2-producing *Klebsiella pneumoniae* received:

1) **no decolonization** treatment.

2) decolonization treatment with a **non-absorbable antibiotic** regimen (NAA) consisting in 10 mL every 6 h per os of a mixture of colistin 10 mg/mL plus amikacin 8 mg/mL plus nystatin 30 mg/mL for 10 days, or

3) decolonization treatment with the same **NAA regimen followed by a probiotic (Vivomix®)** for 20 days.

Vivomix® contains a combination of 4 Lactobacillus (*L. paracasei* DSM 24733, *L. acidophilus* DSM 24735, *L. delbrueckii* ssp *bulgaricus* DSM 24734, *L. plantarum* DSM 24730), 3 Bifidobacteria (*B. brief* DSM 24732, *B. longum* DSM 24736, *B. infantis* DSM 24737), and *Streptococcus thermophilus* DSM 24731 at a concentration of 450 billion live lyophilized bacteria per sachet.

Material and Methods

The different strategies were done **consecutively** according to the availability of the polyantibiotic oral solution and the probiotic. Transplant recipients did not receive the probiotic for safety concerns.

Eradication was defined as a negative control rectal swab after a month of follow-up in the non- decolonization group or after a month after the end of the NAA regimen in the other groups.

Grupo sin tratamiento	Grupo NAA x 10días	Grupo NAA+ Vivomix 1sobre/12h
N= 21	N= 25	N= 25

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Patient characteristics according to treatment group

Characteristic	No de-colonization (n=21)	Oral NAA (n=25)	Oral NAA plus probiotic (n=25)	p
• Age	65.6±10.2	56.4±15.1	63.7±15.3	0.053[b]
• Female sex	13 (62%)	15 (60%)	11 (44%)	0.39
• Age-adjusted Charlson index[a]	5 (3.5-8.5)	4 (3-7)	5 (2.5-6)	0.28[c]
• Barthel index[a]	100	100	100	0.26[c]
• HSCT	0	4 (16%)	0	0.02
• Solid organ transplantation	3 (14%)	5 (20%)	0	0.07
• Receipt of systemic antibiotics	12 (57%)	21 (84%)	15 (60%)	0.09

HSCT: hematopoietic stem cell transplantation [a]Median (IQI). [b]ANOVA. [c]Kruskal-Wallis

Bivariate analysis of the association of clinical variables with eradication

Variable	Eradication (n=54)	No eradication (n=17)	OR (95% CI)	p
• Age	61.1 ±15.1	63.4 ±13.1	-	0.55
• Female sex	29 (54%)	10 (59%)	0.8 (0.3-2.5)	0.7
• Charlson index	5 (3-7)	4 (2-7.5)	-	0.8
• Barthel index	100	100	-	1
• HSCT	3 (6%)	1 (6%)	0.9 (0.09-10)	1
• Solid organ transplantation	8 (15%)	0	-	0.2
• Receipt of systemic antibiotics	33 (61%)	15 (88%)	0.2 (0.04-0.99)	0.042
• Decolonization treatment				
- None	15 (28%)	6 (35%)	Reference	
- NAA	17 (32%)	8 (47%)	0.85 (0.2-3.3)	0.8
- NAA plus probiotic	22 (41%)	3 (18%)	2.9 (0.63-14)	0.16

HSCT: hematopoietic stem cell transplantation. NAA: non-absorbible antibiotics

Exploratory multivariate analysis of the association of clinical variables with eradication

Variable	OR (95% CI)	p
• Receipt of systemic antibiotics	0.14 (0.03-0.73)	0.02
• NAA plus probiotic * receipt of systemic antibiotics	4.3 (0.8-25)	0.086

Eradication by receipt of systemic antibiotics stratified by decolonization strategy

Eradication rate in patients receiving systemic antibiotics (20/33, 63%) vs not receiving them (12/13, 92%):
OR= 0.12 (0.01-1.1), p=0.07

Eradication rate in patients receiving systemic antibiotics (13/15, 87%) vs not receiving them (9/10, 90%): 0.72 (0.05-10), p=0.8

		ERADICATION	
	SYSTEMIC ATB	Yes	No
No decolonization treatment (n=21)	No	8/9 (88,9)	1/9 (11,1)
	Yes	7/12 (58,3)	5/12 (41,7)
Non absorbable antibiotics (NAA) (n=25)	No	4/4 (100)	0/4 (0,0)
	Yes	13/21 (61,9)	8/21 (38,1)
NAA + Probiotic (n=25)	No	9/10 (90,0)	1/10 (10,0)
	Yes	13/15 (86,7)	2/15 (13,3)

Conclusions:

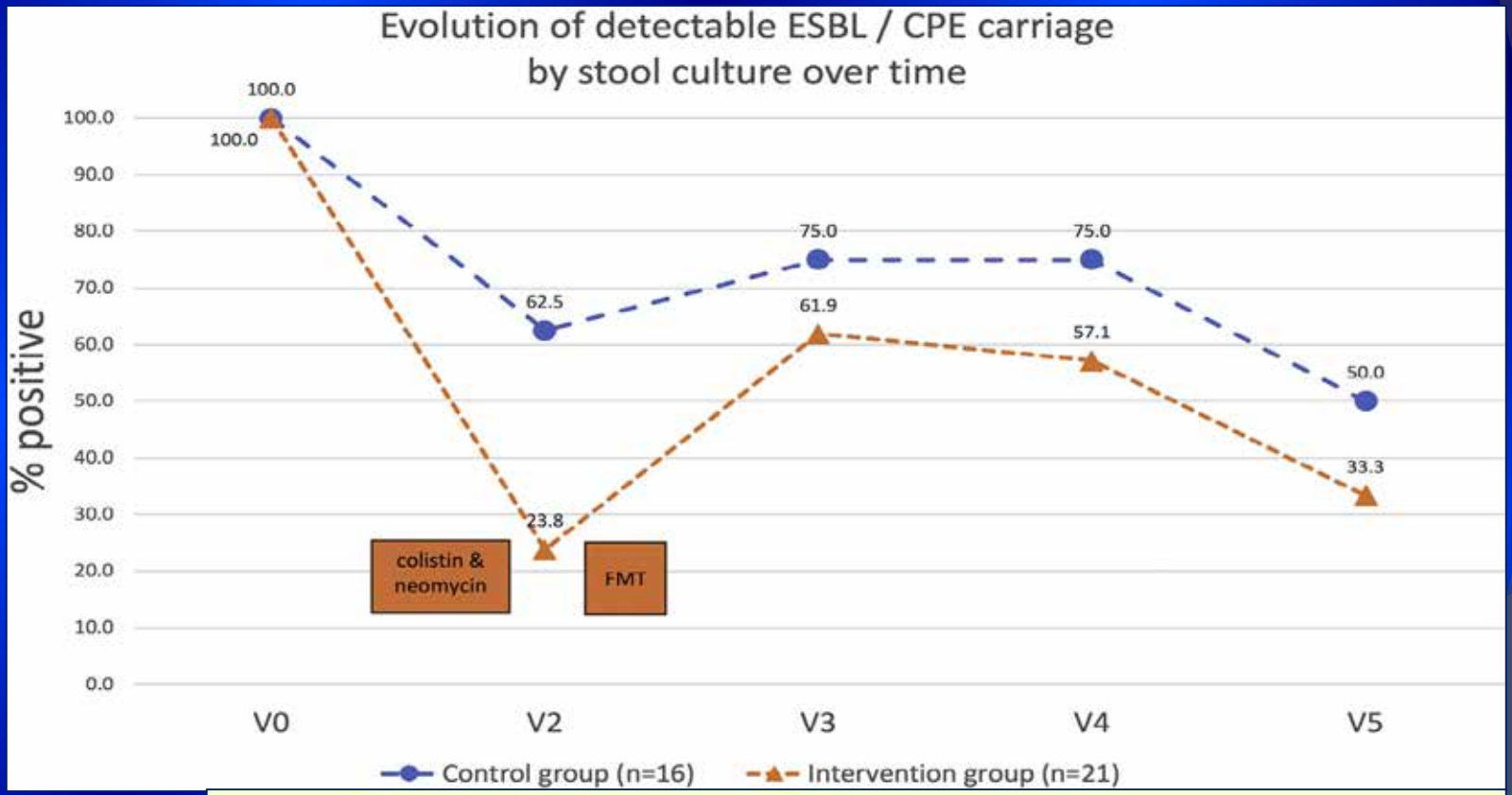
76% of rectal carriers of KPC-2-producing *K. pneumoniae* had a negative rectal swab at one month of follow-up regardless of whether they were subjected or not to decolonization therapy (15/21, 71% in non-decolonized vs 39/50, 78% in decolonized patients, p=0.5).

To receive systemic antibiotics was significantly associated with a decrease in the eradication rate (33/48, 68% in patients receiving systemic antibiotics vs 21/23, 91% in those not receiving them, adjusted OR=0.14, 95%CI 0.03-0.73, p=0.02).

Administration of a probiotic was associated with a non-significant higher eradication rate in the subgroup of patients that received systemic antibiotics (13/15, 87% vs 20/33, 61%; OR=4.3, 95%CI 0.8-25, p=0.09), but this trend was not observed in patients not receiving systemic antibiotics (9/10, 90% vs 12/13, 92%; OR=0.75, 95%CI 0.04-14.2, p=1).

A 5-day course of oral antibiotics followed by faecal transplantation to eradicate carriage of multidrug-resistant Enterobacteriaceae: a randomized clinical trial.

B.D. Huttner et al. Clinical Microbiology and Infection Dic 2018

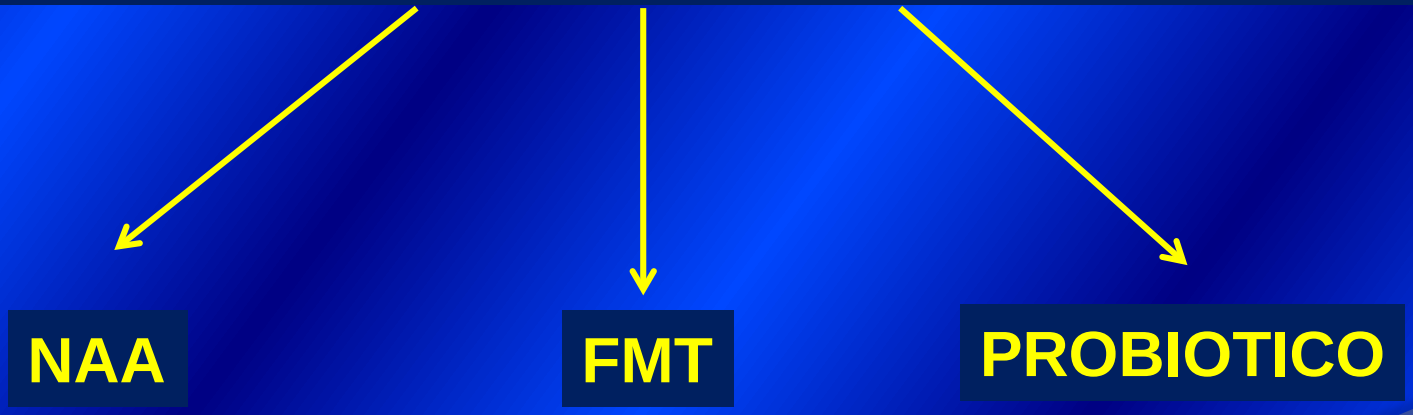


Enterobacterias productoras de carbapenemasas.

Descolonización vs DISMINUCIÓN DEL INÓCULO.

Disminuir la transmisión

Disminuir la probabilidad de traslocación e infección.



Y SI….

NAA+PROBIOTICO

Reducir el inóculo
Disminuir la probabilidad de transmisión
Disminuir el riesgo de infección

FMT


THANK
YOU
GRACIAS
ARIGATO
SHUKURIA
GOZAIMASHITA
EFCHARISTO
TASHAKKUR ATU
YAQHANYELAY
SUKSAMA
EKHMET
MEHRBANI
GRAZIE
BOLZÏN
MERCI
BÏYAN
SHUKRIA
TINGKI
DANKSCHEEN
JUSPAXAR
KOMAPSUMNIDA
MAAKE
PALDIES
MINMONCHAR
MAKETAJ
SIKOMO
EKOJU
HÀTUR
GUI
UNALCHÉESH
SPASIBO
DENKAUJA
NENACHALHYA
MERSI
ATTO
ANIHA
DHANYABAAD
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SNACHALHUYA
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TAVTAPUCH
MEDAWAGSE
AGUYJE
FAKAAUE
BAINKA