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Concomitant infection of *Clostridium novyi* (A, B) and *Clostridium sordellii* in mice

EL SANOUSI (S. M.), ABDELRAHMAN (S. B.), OSMAN (A.). Infection concomitante de *Clostridium novyi* (A, B) et *Clostridium sordellii* chez la souris. *Rev. Elev. Méd. vét. Pays trop.*, 1987, **40** (3) : 243-245.

L'incorporation des spores de *C. sordellii* (ovin) avec celles de *C. novyi* (B) et des spores de *C. sordellii* (bovin) avec celles *C. novyi* (A) ont augmenté la pathogénicité de *C. novyi* (A et B) pour la souris. *Mots clés* : Souris - *Clostridium sordellii* - *Clostridium novyi* - Pathogénicité.

INTRODUCTION

Clostridium sordellii had been frequently isolated from lesions of malignant oedema is considered to be definite pathogen (3). It has also been frequently found to be responsible for infection in cattle and man.

Clostridium sordellii with other bacteria was isolated from haemorrhagic and necrotic lesion of bovine gastrointestinal tract by BROOKS, STERNE and BETTY (5) and AL MASHAT and TAYLOR (2).

SMITH, SAFFORD and HAWKINS (9) reported the presence of haemorrhagic enteric lesion in sheep with *C. sordellii* infections, but did not isolate the organism from the intestine. *C. sordellii* was also reported in lambs and sheep with enterotoxaemia by POPOFF (7) and in lambs with enterotoxaemia by RICHARDS and HUNT (8).

WILLIAMS (10) isolated *C. sordellii* from three cases of cattle myocytis, but he concluded that *C. sordellii* is not an important cause of cattle myocytis. In 1979, BLOOD, HENDERSON and RADOSTITS reported that *C. sordellii* was associated with gangrenous lesion such as malignant oedema in both cattle and sheep (4).

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The incrimination of *C. sordellii* in various pathological conditions have encouraged us to investigate the properties of this ignored pathogen and its role in the enhancement of the pathogenicity and this is the objective of this article.

MATERIAL AND METHODS

Enhancement of the pathogenicity of *Clostridium novyi* type A and *Clostridium novyi* type B by the incorporation of *Clostridium sordellii* sheep and cattle strains : sixty white mice were distributed into six groups of ten each and designated : N, 1/8, 1/16, 1/32, 1/64, and 1/128.

Clostridium novyi type B culture was double diluted and 0.5 ml of each dilution was used to inoculate a mouse in the corresponding sub-group.

The procedure was repeated in another group of mice using *C. novyi* B [0.5 ml + 0.25 ml undiluted *C. sordellii* (Sheep) culture].

The pathogenicity of *C. sordellii* (Sheep) alone was tested in a group of 4 mice inoculated with 0.25 ml *C. sordellii*. To all these inocula 0.25 ml sterile $CaCl_2$ was added.

This experiment was repeated using *C. novyi* type A and *C. novyi* type A plus *C. sordellii* (Cattle), but here the dilutions used were : N, 1/2, 1/4 and 1/8.

RESULTS

Clostridium sordellii (Sheep and Cattle) strains were found to be non pathogenic, but the addition of *C. sordellii* sheep strain to *Clostridium novyi* type B enhances the pathogenicity of *C. novyi* type B (Table I) and the addition of *C. sordellii* cattle strain was found to enhance the pathogenicity of *C. novyi* type A (Table II).

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TABLE I Deaths among mice inoculated with **C. novyi** *(B),* **C. sordellii** *or a mixture of both.*

Strain	Culture dilution					
	N	1/8	1/16	1/32	1/64	1/128
C. novyi B (0.5 ml)	10/10	10/10	10/10	0/10	0/10	0/10
C. novyi B 0.5 ml + *C. sordellii* 0.25 ml	10/10	10/10	10/10	10/10	10/10	10/10
C. sordellii sheep 0.25 ml	0/10	0/10	0/10			

Each inoculum was mixed with 0.25 ml sterile $CaCl_2$.

TABLE II Deaths among mice inoculated with **C. novyi** *(A),* **C. sordellii** *(cattle) or a mixture of both.*

Strain	Culture dilution			
	N	1/2	1/4	1/8
C. novyi (A) 0.5 ml	10/10	0/10	0/10	0/10
C. novyi (B) + *C. sordellii* (cattle)	10/10	10/10	10*/10	10*/10
C. sordellii (cattle) 0.25 ml	0/10	—	—	—

Each inoculum was mixed with 0.25 ml sterile $CaCl_2$.
* The animals were severely infected but did not die.

DISCUSSION

The association of *C. sordellii* with other organisms in producing a disease was reported by many workers (2, 7, 6). These authors reported the association of *C. sordellii* and *C. perfringens* type A with enteric lesions in animals. They suggested that the two bacteria act synergistically in producing enteric disease. Also, ABU-SAMRA *et al.* (1) isolated from infectious hepatitis (black disease). They concluded that the presence of *C. sordellii* aggravated and complicated the infection of sheep with *C. novyi*. The same finding was reported by STERNE and BATTY (10). A result which is substantiated by the present study.

CONCLUSION

The increasing reports incriminating *C. sordellii* in various diseases warrant further investigation.

EL SANOUSI (S. M.), ABDELRAHMAN (S. B), OSMAN (A.). Concomitant infection of *Clostridium novyi* (A, B) and *Clostridium sordellii* in mice. *Rev. Elev. Méd. vét. Pays trop.*, 1987, **40** (3) : 243-245.

The incorporation of *C. sordellii* (sheep) spores with *C. novyi* (B) and *C. sordellii* (cattle) spores with *C. novyi* (A) enhanced the pathogenicity of the *C. novyi* (B and A) for mice. *Key words* : Mice - *Clostridium sordellii* - *Clostridium novyi* - Pathogenicity.

EL SANOUSI (S. M.), ABDELRAHMAN (S. B.), OSMAN (A.). Infección concomitante de *Clostridium novyi* (A, B) y *Clostridium sordellii* en el ratón. *Rev. Elev. Méd. vét. Pays trop.*, 1987, **40** (3) : 243-245.

La incorporación de las esporas de *C. sordellii* (oveja) con las de *C. novyi* (B) y de las esporas de *C. sordellii* (bovino) con las de *C. novyi* (A) aumentaron la patogenicidad de *C. novyi* (A y B) para el ratón. *Palabras claves* : Ratón - *Clostridium sordellii* - *Clostridium novyi* - Patogenicidad.

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