

## The Spasmolytic and Relaxing Effect of Streptidin on Smooth Muscle

Streptidin'in Düz Adele Üzerine Spasmolitik ve Relaksan Etkisi

Orhan ALTINKURT \*

Streptomycin has an abortive effect on pregnant test animals (1). It is well known that streptomycin has a relaxant effect on the colon of the rat (2), on the ileum of the guinea pig (3) and curarising effect on the striated muscles (4). It is also known that some antibiotics show a biphasic stimulating or depressing effect which is proportional with the dose given. As well, streptomycin has a relaxant effect on the uterus of the rabbit, guinea pig, rat and the fibromyomatous uterus of the woman (5).

It was stated that this relaxant effect of streptomycin could be related to the guanidin and diamino groups in its structure (2). After splitting (6,7,2) of the streptomycin molecule into streptidin and streptobiosamin we have examined the spasmolytic and relaxant effect of the products and found that the spasmolytic and relaxant effect was due to the streptidin fraction of the streptomycin molecule. Streptobiosamin itself has been found ineffective on the plain muscle.

### MATERIALS AND METHOD

For the examination of the isolated guinea pig uterus we have used Dale solution which was put into the isolated organ bath and warmed up to 37°C. during the procedure.

Redaksiyona verildiği tarih : 5 Mart 1970

\* Department of Pharmacology, Faculty of Pharmacy, University of Ankara

The effect of the streptomycin, streptidin and streptobiosamin on the contraction of the muscle induced by acetylcholin has been studied. The capacity of the reservoir used for the purpose was 50 ml,

Other material used were :

ACETYLCHOLIN 10<sup>-3</sup>  
 STREPTOMYCIN SULFAT (R) squibb  
 STREPTIDIN SULFAT  
 STREPTOBIOSAMIN

#### RESULTS AND DISCUSSION

After using 1 mcgr of Acetylcholin the contraction of the guineapig uterus reached to its pick, the spasmolytic and relaxant effects of 500 mgr. Streptidin, 100 mgr. Streptomycin and 500 mgr. of streptobiosamin in 0,5 ml solution were examined. 500 mgr of streptidin and 100 mgr of streptomycin have shown the some rate of antispasmodic effect whereas streptobiosamin showed no such effect at all. 100 mgr of streptidin alone was five times less effective than the same amount of streptomycin. Since we found streptobiosamin ineffective and the streptidin less effective than the streptomycin as a whole, the high effect observed in the streptomycin then, might be due to the combination of streptidin and streptobiosamin.

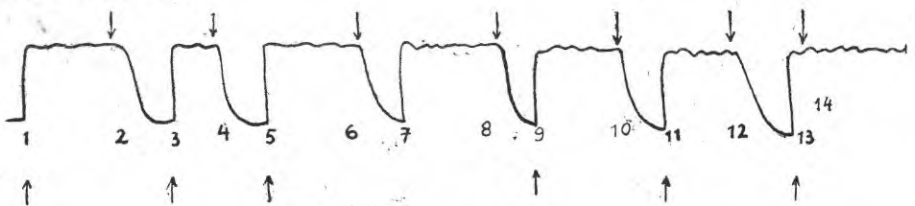


Fig : 1

1,3,5,7,9,11,13	Acetylcholin 1 mcgr
2	Streptidin 0.5 gr
4	Streptomycin 100 mgr
6	Streptidin 1 gr
8	Streptidin 1 gr
10	Streptomycin 100 mgr
12	Streptidin 1 gr
14	Streptobiosamin 0,5 gr

## SUMMARY

The abortive effect of the streptomycin on pregnant test animals and its relaxant and antispasmodic effect on smooth muscle is caused by its streptidin fraction since the streptobiosamine moiety of the streptomycin molecule has no relaxant effect, it is still unknown why the combination of streptidin and streptobiosamin in the streptomycin molecule shows a more potential effect than in the case when the streptidin fraction is used separately.

## ÖZET

Streptomycin'in gebe tecrübe hayvanlarındaki abortif etkisi ve düz adeledeki relaksan antispazmodik etkisi streptomycin'in parçalanma fractionlarından olan streptidin'den ileri gelmektedir. Diğer parçalanma maddesi olan streptibiosamin'in etkisi yoktur. Streptidin ve streptobiosamin'in beraberce bulunduğu streptomycin'de ise relaksan etki separe kullanılan streptidinden daha fazladır.

## ACKNOWLEDGMENTS :

The author wishes to thank Dr. Pharmacist NOYANALPAN for his very kind help in splitting of the streptomycin molecule into its constituents, streptidin and streptobiosamin.

## REFERENCES

- 1 — Altinkurt. O., Gönen T., 1967 : Effect abortif de la streptomycine sur les animaux d'experience de la laboratoire gravides. *Arc. de l'uni, med. Balkanique* 4 - 5, 489 - 492
- 2 — Kurt Simon., 1950 : Die Bedeutung der guanidin gruppen für die darmlöhmende Wirkung des streptomycins *Arch. Int. Phar.* 1. 83, 125
- 3 — Dzoljic, M., 1965 : Action of streptomycin on guinea pig ileum peristalsis. *Arch. Int. Pharm.* 156, 279
- 4 — Brazil, G.G., and Corrado A.P., 1957 : The curariforme action of streptomycin *J. Pharm. exp. ther* 120, 452 - 459
- 5 — Altinkurt. O., 1968 : Effet spasmodique antispasmodique de la streptomycine sur les muscles lisse, *Türk Hij, Tec, biyo. der* 280. 2, 114 - 138
- 6 — H. E. Carter., R.K. Clark., J.R., S.R. Rekman science 1946 : Degradation of streptomycine and structure of streptidine and streptomine 103,540
- 7 — J. Fried and O. Wintersteiner *J. Amer. Chem. sol* 1947 : streptomycine 11 reduction and oxidation products of streptomycin and of streptobiosamine 69, 79