

6441

## Use of Pitressin in Local Anesthesia.\*

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The use of epinephrine in solutions for local anesthesia by injection is unsatisfactory as sterilization is impossible, the solution may cause edema, and under certain conditions, may be more toxic than the local anesthetic alone.<sup>1</sup> However the anesthesia produced by the local anesthetic alone is often insufficient. Spagnol<sup>2</sup> has claimed that solutions of procaine containing a pressor substance from the posterior pituitary lobe cause prolonged anesthesia, never cause edema, may be sterilized, and are not more toxic than procaine alone. These statements are not entirely true.

Modifying the method of Rose<sup>3</sup> by injecting intradermally in symmetrical spots on guinea pigs 0.1 cc. of a 1% solution of procaine hydrochloride, and the same containing epinephrine or pitressin, it was found that 1 cc. of pitressin solution (20 pressor units) per 100 cc. prolonged anesthesia as much as 1-50,000 epinephrine. Half this concentration of pitressin had some effect, one-fifth none. Prolongation of local anesthesia by pitressin was not lost after sterilization in the autoclave for one hour at 15 pounds, while the epinephrine-containing solution did not differ from procaine alone after such treatment (Table I).

TABLE I.  
Duration of effect of anesthetic mixtures. Ratio of mixture to procaine alone.

Concentration in 1% procaine	Unheated	Heated
Pitressin 1-500	1.0	—
"    1-200	1.7	1.5
"    1-100	4.6	—
Epinephrine 1-50,000	4.2	1.0

The toxicity of procaine on intravenous injection in rabbits is increased somewhat by the presence of 1-50,000 epinephrine. This does not occur if pitressin is present in a minimal concentration for

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<sup>1</sup> Taubman, G., and Jung, G., *Arch. f. Exp. Path. u. Pharm.*, 1930, **156**, 18.

<sup>2</sup> Spagnol, G., *Rev. sud-americana endocrinol. immunol. quimioterap.*, 1931, **14**, 569.

<sup>3</sup> Rose, C. L., *J. Lab. and Clin. Med.*, 1929, **15**, 128.

prolongation of anesthesia, but if enough pitressin is added to produce a local anesthesia equal to that with procaine-epinephrine, the intravenous toxicity is increased, and to the same extent as with epinephrine (Table II).

TABLE II.  
Intravenous toxicity of procaine, procaine-pitressin, and procaine-epinephrine.  
Mortality Ratio: No. of animals dying/No. of animals used.

mg./kg.	Procaine	Procaine+1-200 Pitressin	Procaine+1-100 Pitressin	Procaine+1-50,000 Epinephrine
20	—	—	0/3	0/2
25	0/5	—	2/5	1/3
30	1/5	0/1	2/5	3/5
35	3/5	1/3	3/4	—
40	4/5	3/3	—	—

Furthermore, pitressin does not delay absorption sufficiently to reduce the subcutaneous toxicity of a local anesthetic. Pantocain (courtesy Winthrop Chemical Co.), a local anesthetic resembling procaine, in a subcutaneous dose of 25 mg./kg. kills 6 of 8 rabbits. The same dose killed 2 of 3 rabbits although pitressin 1-100 was present, it serving only to delay the onset of symptoms. In a solution of 1-50,000 epinephrine, the same dose of pantocain produced no intoxication in 3 rabbits.

*Summary.* The addition of pitressin to a solution of a local anesthetic agent prolongs anesthesia on intradermal injection, and permits of sterilization. Both pitressin and epinephrine increase the intravenous toxicity of a local anesthetic. While epinephrine by delaying absorption reduces the subcutaneous toxicity, pitressin does not.

## 6442

### Effect of Suprarenalectomy on Sugar Tolerance.

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The rabbit adapts itself well for the determination of sugar tolerance because of the convenience with which sugar can be given in the ear vein and the ease with which the blood can be withdrawn without excitement. Bilateral suprarenalectomy can readily be performed in 2 stages with good recovery of the animal but with a