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**EXCRETION OF THIAMINE, RIBOFLAVIN, NIACIN AND PANTOTHENIC ACID IN HUMAN SWEAT**THEODORE CORNBLEET, M.D.; ERNST R. KIRCH, Ph.D.; OLAF BERGEIM, Ph.D.; [et al](#)

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**Abstract**

The excretion of vitamins in sweat is of interest from the standpoint of the metabolism of such vitamins in the body and the possible loss of such vitamins by this channel, especially in instances of profuse sweating. Such results also have a bearing on the physiology of perspiration. The amount of sweat vitamins might also conceivably have a bearing on the growth of organisms on the skin, since some of these vitamins have a definite effect on the growth of certain micro-organisms.

One of us has reported on the excretion of ascorbic acid in sweat.<sup>1</sup> An increased excretion of this vitamin was noted in sweat after administration of large doses of the vitamin. Hardt and Still<sup>2</sup> studied the excretion of thiamine as well as of ascorbic acid in sweat after exercise. They concluded that 5 to 15 per cent of ingested thiamine might be the daily loss by

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needle of any obstruction. The plunger is withdrawn gently in order to make sure that the tip of the needle is not lying within the lumen of a blood vessel or within the subarachnoid space. Twenty-five cc. of the anesthetic solution is injected slowly into the caudal canal. As soon as the initial dose has been injected the syringe

3. Epinephrine should be added to the initial injection of anesthetic solution into the caudal canal in all cases except those of toxic reactions.

4. Continuous caudal anesthesia may be of service in cases of eclampsia, for 3 patients with eclampsia were delivered while under caudal anesthesia without any

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supported in place while the needle is removed. The catheter is taped to the skin and the region is sealed with adhesive tape to prevent soiling from the perineum. The patient may now be turned on her back and made comfortable. It is important to refrain from advancing the tip of the catheter more than 1½ inches (3.8 cm.) into the caudal canal. If the catheter is placed high in the canal, unilateral anesthesia may result.

Additional injections of 25 cc. of the anesthetic solution are given whenever the patient begins complaining of discomfort.

#### COMMENT

We believe that the catheter method is much safer than the method of using an indwelling needle. If a needle breaks in the caudal canal, surgical intervention for its removal will be necessary. Indwelling needles also produce an unnecessary amount of trauma inside the caudal canal. The sacrococcygeal ligament acts as a fulcrum, holding the hub of the needle in a fixed position. Every motion of the patient will cause the tip of the needle to sweep the inside of the caudal canal, damaging the vascular plexus and traumatizing the periosteum. This cannot happen if the needle is replaced with a flexible ureteral catheter.

The position of the patient during the initial injection is important. We do not believe we are justified in employing the knee-chest position. If the patient is placed in a modified right Sims position near the edge of the bed it is an easy matter to reach over her and place the needle and catheter in the caudal canal.

We have kept our patients in a slight Fowler position during labor. This prevents the anesthesia from ascending to an unnecessary height and also prevents the fall in blood pressure and nausea which frequently occur if the anesthetic solution ascends to envelop the thoracic nerves.

Our first 25 or 30 patients were anesthetized with 1.5 per cent solution of procaine without epinephrine. In these cases we observed a few who had a sudden lowering of blood pressure followed by a feeble thready pulse, nausea and vomiting. Since that time we have included 2 minims of epinephrine with the initial injection for all patients except those with toxemia. We have not observed evidence of cardiovascular collapse since epinephrine was added to the anesthetic solution, nor have the patients become nauseated.

We have used metycaine for a number of patients and have not been able to demonstrate results superior to those obtained with procaine. Procaine has been used in the majority of our cases because we believe it to be the safest local anesthetic agent available at present.

#### CONCLUSIONS

1. Continuous caudal anesthesia is satisfactory in most cases.

2. We feel that the use of a ureteral catheter is safer and more comfortable for the patient.

## EXCRETION OF THIAMINE, RIBOFLAVIN, NIACIN AND PANTOTHENIC ACID IN HUMAN SWEAT

THEODORE CORNBLEET, M.D.

ERNST R. KIRCH, Ph.D.

AND

OLAF BERGEIM, Ph.D.

WITH THE TECHNICAL ASSISTANCE OF  
MR. J. D. SOLOMON

CHICAGO

The excretion of vitamins in sweat is of interest from the standpoint of the metabolism of such vitamins in the body and the possible loss of such vitamins by this channel, especially in instances of profuse sweating. Such results also have a bearing on the physiology of perspiration. The amount of sweat vitamins might also conceivably have a bearing on the growth of organisms on the skin, since some of these vitamins have a definite effect on the growth of certain micro-organisms.

One of us has reported on the excretion of ascorbic acid in sweat.<sup>1</sup> An increased excretion of this vitamin was noted in sweat after administration of large doses of the vitamin. Hardt and Still<sup>2</sup> studied the excretion of thiamine as well as of ascorbic acid in sweat after exercise. They concluded that 5 to 15 per cent of ingested thiamine might be the daily loss by way of the sweat and that the giving of 50 mg. of thiamine to their subjects led to an increased excretion of thiamine by this channel. Results on niacin, pantothenic acid and riboflavin do not appear to have been previously reported.

We have studied the excretion of thiamine, niacin, riboflavin and pantothenic acid in heat sweat of human subjects with and without the administration of large doses of these vitamins. The subjects were normal men.

#### METHODS

Specimens of sweat were collected as follows: The subjects were encased in a rubber bag as far as their necks and were seated in a heat cabinet. Incandescent lamps furnished sufficient heat to obtain 100 to 200 cc. of sweat in twenty to thirty minutes.

Thiamine was determined by the chemical method of Kirch and Bergeim,<sup>3</sup> and niacin,<sup>4</sup> pantothenic acid<sup>5</sup>

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From the Departments of Dermatology, Physiological Chemistry and Chemistry, University of Illinois College of Medicine and of Pharmacy.

1. Cornbleet, Theodore; Klein, R. T., and Pace, E. R.: Vitamin C Content of Sweat, *Arch. Dermat. & Syph.* **34**: 253 (Aug.) 1936.

2. Hardt, L. L., and Still, E. U.: Thiamine in Sweat, *Proc. Soc. Exper. Biol. & Med.* **48**: 704-707 (Dec.) 1941.

3. Kirch, E. R., and Bergeim, Olaf: The Chemical Determination of Thiamine, *J. Biol. Chem.* **143**: 575-588 (May) 1942.

4. Snell, E. E., and Wright, L. D.: A Microbiologic Method for the Determination of Nicotinic Acid, *J. Biol. Chem.* **139**: 675 (June) 1941.

5. Pennington, Derrol; Snell, E. E., and Williams, R. J.: An Assay Method for the Pantothenic Acid, *J. Biol. Chem.* **135**: 213 (Aug.) 1940. Silber, R. H., and Unna, Klaus: Studies on the Urinary Excretion of Pantothenic Acid, *J. Biol. Chem.* **142**: 623-628 (Feb.) 1942.

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