

NOTE**Reactions of Urinary Stones with Glycine, β -Alanine and Hippuric Acid**

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Insoluble ingredients of the kidney stones (powdered stones and then whole stones) were made to solubilized with glycine, β -alanine and hippuric acid. It was found that the dissolution of stone ingredient in powdered form was much more than the whole stone.

Key Words: Urinary stones, Glycine, β -Alanine, Hippuric acid.

The ultimate shape of a renal calculi¹ results from several forces working together. The basic crystalline characteristics of the stone are influenced by local factors *i.e.*, mobility or fixation¹, wall contact with resulting pressure and mucous coating, urine flow and stasis. Recognition of the active factors operating to form each stone² separately, may help in prognosis and provide a logical surgical attack and open avenues for preventing stone growth³.

TABLE-1
SOLUBILITY OF URINARY WHOLE STONE IN
DIFFERENT INHIBITORS

Inhibitor (0.01 M)	Sample	Wt. of whole stone (mg)	Wt. remained after N/10 NaCl treatment (mg)	Wt. remained after inhibitor treatment (mg)	Difference (solubility in mg/25 mL)
Glycine	A	281.7	280.0	279.0	2.7
	B	235.6	233.0	232.6	3.0
β -Alanine	A	122.5	117.0	115.0	7.5
	B	128.5	121.0	120.0	8.0
Hippuric acid	A	142.5	140.2	137.9	4.6
	B	105.0	102.0	99.8	5.2

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TABLE-2
SOLUBILITY OF URINARY POWDERED STONE IN
DIFFERENT INHIBITORS

Inhibitor (0.01 M)	Sample	Wt. of powdered stone (mg)	Wt. remained after N/10 NaCl treatment (mg)	Wt. remained after inhibitor treatment (mg)	Difference (solubility in mg/25 mL)
Glycine	A	263.1	261.3	259.3	3.8
	B	223.6	222.2	219.7	3.8
β -Alanine	A	106.6	99.5	96.6	10.0
	B	111.6	108.9	106.4	10.2
Hippuric acid	A	122.1	117.4	114.1	8.0
	B	92.5	89.1	77.9	14.6

N/10 solution of NaCl and 0.01 M solution of glycine, β -alanine and sodium salt of hippuric acid were prepared in distilled water. Whole stone sample were kept in 25 mL of NaCl solution for 48 h. They were filtered and dried in an air oven and then kept in 25 mL of inhibitor solution for the next 48 h. Again filtered, dried and weighed. Same experiments were done with powdered stone samples also.

It was found that the dissolution of stone ingredient with glycine, β -alanine and hippuric acid in powdered form was much more than the whole stone (Tables 1 and 2). This led to infer that the outer surface of the stone is much more stubborn and the inhibitors are not able to react so easily, to make soluble the ingredients of the stone. Nevertheless, the dissolution of a part of the ingredient of the whole stone definitely loosens the hardness of the stone. This stone then become very much susceptible to attack and the inhibitors then further dissolved the stone and the stone crumbled.

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