

DIAGNOSTIC VALUE OF SILVER NITRATE TEST FOR ALUMINUM PHOSPHIDE POISONED PATIENTS

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Objectives: This study was done to determine on arrival silver nitrate test (SNT) diagnostic by comparing SNT results to patient's lab data and outcome, in suspected ALP-ingestion patients.

Methods: Data collected included demographics, gastric and/or exhalation SNT, blood pressure and blood gas analysis in different time intervals, until death or discharge. For purpose of this study "gold standard" for definition of ALP exposure were defined as those who ingest rice tablet, which may be aluminum phosphide (ALP) or botanical preparations AND had positive SNT OR SBP \leq 80 mmHg OR (pH \leq 7.2 AND Hco3 \leq 13 meq/L) OR were dead at any time during hospitalization. Total SNT was considered positive if one of the exhalation or gastric SNT were positive.

Results: Sixty three patients including 33 female (52.4%) recruited in this study. Of whom 30 cases fulfilled above mentioned criteria to be exposed to ALP. Exhalation SNT alone, gastric SNT alone or both tests together were done in 4, 7 and 52 cases respectively.

SBP \leq 80 mmHg, pH \leq 7.2, Hco3 \leq 13 meq/L was happened in 14(22%), 15(24%) and 17(27%) cases respectively. SNT was positive in 23(37%) cases and 20(32%) patients expired. By this definition 30 patients were considered as ALP-exposure patients (gold standard). Of 52 cases with both tests, gastric and exhalation SNT were both positive in 7 (13.5%) cases, both negative in 37 (71.2%) cases, positive exhalation but negative gastric SNT in one (1.9%) and negative exhalation but positive gastric SNT in 7 (13.5%) cases. Table 1 shows diagnostic value of SNT in different time intervals.

Conclusions: Negative SNT particularly by exhalation route can not rule out ALP exposure. Time elapsed ingestion can affect validity of SNT. This test has no value after 12 hours post ALP exposure.

Table 1- Diagnostic value & comparison of exhalation and gastric Silver Nitrate Test with Gold Standard in different time intervals

	Mean time intervals (hrs)									Anytime†		
	0.5-3			4-6			7-12					
Test used	GSNT	ESNT	total	GSNT	ESNT	total	GSNT	ESNT	total	GSNT	ESNT	total
	n=19	n=20	n=21	n=14	n=15	n=16	n=22	n=18	n=22	n=59	n=56	n=63



<i>Sensitivity</i>	78.6	42.7	80	75	50	80	60	33.3	70	71.4	41.7	76.7
(%)	49.2-	17.8-	51.9-	20.3-95.9	8.3-	28.8-	26.4-	5.3-	34.8-93	51.3-	22.1-	57.7-
95% CI	95.1	71.1	95.4		91.7	96.7	87.6	77.3		86.7	63.3	90
<i>Specificity</i>	100	100	100	100	100	100	100	100	100	100	100	100
(%)	30.5-	54.1-	54-100	69-100	71.3-	71.3-	73.3-	73.3-	73.3-	88.3-	88.7-	89.3-
95% CI	100	100			100	100	100	100	100	100	100	100
<i>PPV (%)</i>	100	100	100	100	100	100	100	100	100	100	100	100
95% CI	71.3-	54.1-	73.3-	30.5-100	19.3-	40.2-	54.1-	19.3-	58.9-	83.1-	69-100	85.10
	100	100	100		100	100	100	100	100	100		0
<i>NPV (%)</i>	50	42.9	66.7	90.9	84.6	91.7	75	75	80	78.9	68.9	82.5
95% CI	12.4-	17.8-	30.1-	58.7-98.5	54.6-	61.5-	47.6-	47.6-	51.9-	62.7-	53.3-	67.2-
	87.6	71.1	92.1		97.6	98.6	92.6	92.6	91.5	90.4	81.8	92.7
<i>Accuracy</i>	82.3	60	85.7	92.8	86.7	93.7	81.8	77.8	86.3	86.2	74.6	88.9
(%)	56.6-96	36.1-	63.6-	66.1-98.8	59.5-	69.7-99	59.7-	52.4-	65.1-	74.6-	70-85.3	78.4-
95% CI		80.8	96.8		97.9		94.7	93.4	96.9	93.8		95.4
<i>Fisher exact test</i>	0.005	0.115	0.002	0.011	0.057	0.003	0.003	0.098	0.001	<.005	<.005	<0.001

GSNT= Gastric Silver Nitrate Test, ESNT= Exhalation Silver Nitrate Test, PPV= positive predictive value, NPV= Negative predictive value † Four cases of GSNT and 3 cases of ESNT were negative after 12 hours