

Yersinia enterocolitica and Yersinia pseudotuberculosis, Culture and Serology

Background: *Yersinia enterocolitica* and *Yersinia pseudotuberculosis* are gram negative oval rods. Transmission occur by contamination of food (milk, water, meat) with excreta from the reservoir animals such as pigs, goats, sheep, dogs, cats. *Y. enterocolitica* causes enterocolitis that is clinically indistinguishable from that caused by *Salmonella* or *Shigella*. It is characterized by abdominal pain, gastroenteritis and possibly bloody diarrhea. Both *Yersinia* sp. can cause an acute appendicitis resembling mesenteric adenitis. *Yersinia* infection may be associated with reactive arthritis and Reiter's syndrome, but *Salmonella* spp., *Shigella* spp. and *Campylobacter* spp. may also trigger these autoimmune diseases.

Limitations: Low antibody titers of IgG class may persist for years.

Sampling: Culture: 2 g of fresh stool; Serology: 1 mL serum, acute and convalescent serum recommended (at least 1 week apart)

Reference Interval:

Culture:	Report of diagnostic finding
Serology:	Differentiation of immunoglobulin class
	<i>Y. enterocolitica</i> and <i>Y. pseudotuberculosis</i>
	IgA antibody negative: < 0.5 COI
	borderline: 0.5–1.0 COI
	positive: > 1.0 COI
	IgG antibody negative: < 0.5 COI
	borderline: 0.5–1.0 COI
	positive: > 1.0 COI

Validation by immunoblot

Zinc (Zn), Serum or Urine or Seminal Fluid

Related Information: Albumin, Serum
Copper (Cu), Serum or Urine

Background: Zn is an essential trace element with effects on weight, immune function, growth and development. It is a functional compound of more than 300 enzymes. Zinc is mainly eliminated by the feces, minor quantities by the urine. Serum zinc represents approx 1% of total body zinc stores.

Serum zinc is poorly correlated with the status of the zinc stores. In mild zinc deficiency status, serum zinc may be normal. High urine but low serum levels are found in cirrhosis, neoplastic diseases, increased catabolism and in states of urinary loss of zinc such as viral hepatitis, hemolytic anemias, sickle cell diseases, alcoholism, renal diseases. Serum levels are lowered in fever, sepsis, inflammation, corticosteroid therapy, oral contraceptives, pregnancy, and myocardial infarction. Since albumin is the major binding protein for zinc, hypoalbuminemia presents with low serum zinc levels. Copper and zinc are competitive in intestinal resorption, dietary zinc supplement may decrease copper levels. Also folic acid and iron may compete with zinc absorption.

W-X

Y-Z

Drugs decreasing zinc levels are phenytoin, prednisone, valproic acid.

Zinc deficiencies may occur in breast fed infants whose mother's milk is low of zinc, premature infants with low hepatic stores, in growing children, in prepubertal boys with delayed sexual maturity, in malabsorption disorders and diarrhea, in diabetes, nephrotic syndrome, cirrhosis, in AIDS patients, burn patients, in patients receiving high intravenous supplement of amino acids, in pregnant women due to the high uptake by the fetus.

Acrodermatitis enteropathica is characterized by zinc malabsorption which develops in babies presenting with facial and diaper rash when weaned, progressing to growth retardation, diarrhea, impaired T cell function, infections, delayed testicular development. Usually serum and urine zinc concentrations are low, but serum zinc may be normal in some cases.

Sampling: Serum: 1 mL serum. Blood to collect in a metal free container, avoid powdered gloves, avoid probe to contact rubber. Avoid hemolysis or stasis, since red cells contain zinc concentrated 10 times as compared to serum. Serum should be separated immediately after sampling since zinc concentration in whole blood samples increases 5-8% per h.

Urine: For precise evaluation, due to a circadian rhythm, a 24h urine specimen is recommended. Collect in a metal free container and keep cool. Avoid contact with rubber, if specimen can only be obtained by a catheter, a silicon catheter should be used. Ship 10ml to the lab, note total quantity.

Reference Interval:	Serum: Adults	600-1200 µg/L
	Children	750-1000 µg/L
	Urine:	140-800 µg/24h
	Patients supplemented with zinc	> 2000 µg/24h
	Seminal fluid:	90-250 µg/mL