INE INSTITUTE OF NUTRITIONAL ENDOCRINOLOGY

Blood Chemistry: Liver and Gallbladder

Dr. Ritamarie Loscalzo

Medical Disclaimer: The information in this presentation is not intended to replace a one-on-one relationship with a qualified health care professional and is not intended as medical advice. It is intended as a sharing of knowledge and information from the research and experience of Dr. Ritamarie Loscalzo, drritamarie.com, and the experts who have contributed. We encourage you to make your own health care decisions based upon your research and in partnership with a qualified health care professional.

Liver Profile Part 1

- Alanine Aminotransferase (ALT or SGPT): An enzyme found primarily in the liver, also in heart. Abnormalities may represent liver disease.
- Aspartate Aminotransferase (AST or SGOT): An enzyme found in skeletal and heart muscle, liver and other organs. Abnormalities may represent liver disease.
- Bilirubin, Total: A chemical involved with liver functions – breakdown product of hemoglobin. High concentrations may result in jaundice.
- Alkaline Phosphatase: A body protein important in diagnosing proper bone and liver functions. Can be elevated in leaky gut.
- Lactate Dehydrogenase (LDH): An enzyme found mostly in the heart, muscles, liver, kidney, brain, and red blood cells. When an organ of the body is damaged, LDH is released in greater quantity into the blood stream.

Liver Profile Part 2

- **Protein, Total:** Together with albumin, it is a measure of the state of nutrition in the body.
- **Globulin, Total:** A major group of proteins in the blood comprising the infection fighting antibodies.
- **Albumin Serum:** One of the major proteins in the blood and a reflection of the general state of nutrition.
- **Albumin/Globulin Ratio:** Calculated by dividing the albumin by the globulin.
- **GGT:** Gamma-glutamyl transferase - detect liver and bile duct injury. Alcoholism elevates this.

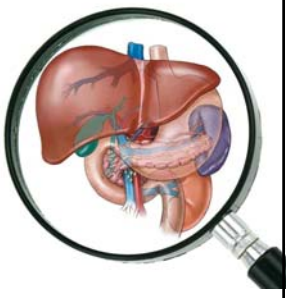
Liver and Gallbladder

Liver

- ✓ GGTP +
- ✓ Alkaline Phosphatase +

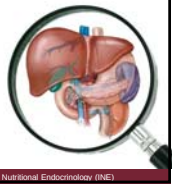
Bile Insufficiency

- ✓ Cholesterol -
- ✓ HDL -
- ✓ LDL -



Liver and Gallbladder

- ✓ Glucose (hi)
- ✓ BUN (lo)
- ✓ Protein (lo)
- ✓ Albumin (lo)
- ✓ Globulin (hi)
- ✓ Bilirubin (hi)
- ✓ Alkaline Phosphatase (hi)
- ✓ LDH (hi)
- ✓ AST (hi)
- ✓ ALT (hi)
- ✓ ALT(lo) early fatty liver
- ✓ GGT (hi)
- ✓ Iron (hi)
- ✓ Cholesterol or LDL (hi) - fatty liver, fat malabsorption, gallbladder stress
- ✓ Iron (hi) hemochromatosis
- ✓ Triglycerides (lo or hi) - fat malabsorption
- ✓ HDL (lo)
- ✓ Monocytes (hi)



Liver Labs

Protein, total, serum	G/dl	6.2	8.3	6.9	7.4	7
Albumin, serum	G/dl	3.8	5.0	4.0	5.0	4.6
Globulin, total	G/100 ml	2.0	3.8	2.4	2.8	2.4
A/G Ratio	units	1.1	2.3	1.5	2.0	1.9
Bilirubin, total	mg/dl	0.1	1.5	0.2	1.2	0.2
Alkaline Phosphatase, S	U/L	27.0	142.0	70.0	90.0	48
LDH	U/L	89.0	215.0	140.0	180.0	146
AST (SGOT)	U/L	1.0	45.0	10.0	26.0	16
ALT (SGPT)	U/L	1.0	55.0	10.0	26.0	10
GGT	U/L	5.0	52.0	10.0	26.0	11

- Decreased Alkaline Phosphatase associated with zinc deficiency and sometimes Vitamin B6, estrogen dominance, malabsorption, hypothyroid or low adrenal function.

Isoenzymes (Isozymes)

- ✓ **LDH**
  - LDH-1 primarily in heart muscle and red blood cells
  - LDH-2 concentrated in white blood cells
  - LDH-3 highest in the lung
  - LDH-4 highest in the kidney, placenta, and pancreas
  - LDH-5 highest in the liver and skeletal muscle
- ✓ **Alkaline Phosphatase**
  - Liver
  - Bone
  - Intestine
  - Placenta

Liver and Gallbladder Case History

CATEGORIES	Units	PATHOLOGICAL RANGE Min	PATHOLOGICAL RANGE Max	FUNCTIONAL RANGE Min	FUNCTIONAL RANGE Max	CURRENT 01/24/10
Bilirubin, total	mg/dl	0.1	1.5	0.2	1.2	0.3
Alkaline Phosphatase, S	U/L	27.0	142.0	70.0	90.0	97
LDH	U/L	89.0	215.0	140.0	180.0	72
AST (SGOT)	U/L	1.0	45.0	10.0	26.0	17
ALT (SGPT)	U/L	1.0	55.0	10.0	26.0	17
GGT	U/L	5.0	52.0	10.0	26.0	11
Iron, serum	ug/dl	40.0	180.0	85.0	130.0	60
Cholesterol, total	mg/dl	0.0	200.0	150.0	200.0	193
Triglycerides	mg/dL	35.0	160.0	75.0	100.0	61
HDL Cholesterol	mg/dl	40.0	-	55.0	-	61
LDL Cholesterol Calc	mg/dl	0.0	130.0	0.0	120.0	120
T. Cholesterol/HDL Ratio	-	0.0	3.7	0.0	3.1	3.2