

Procollagen III Peptide; PIIINP; P3NP

Pseudonyms: Intact N-terminal propeptide of type III collagen

Regular serum PIIINP measurement has now superseded liver biopsy in the monitoring of psoriatic patients undergoing methotrexate therapy and is the main reason for PIIINP requesting.

Increased concentrations of PIIINP are found in a number of conditions where accumulation and/or degradation of connective tissue occur.

In growth deficient children, the induction of growth is reflected in increasing serum PIIINP. Liver fibrosis and cirrhosis of various aetiologies increase serum concentrations of PIIINP. The magnitude of the change seems to be greater when there is inflammation than when there is only silent accumulation of connective tissue.

Serum PIIINP is increased in myeloproliferative diseases, particularly during the active phases of myelofibrosis. In polycythaemia vera, a high PIIINP value may predict transformation into myeloid metaplasia.

Increased serum PIIINP levels are found in several malignant diseases, e.g. in cancers involving the liver. In breast carcinoma with bone metastases, changes in PIIINP can serve as an indicator of response to therapy. In ovarian carcinoma changes in serum PIIINP correlate with the development of the disease. The serum concentration of PIIINP reflects the repair process and scar formation after a myocardial infarction and has also been shown to correlate to infarct size, left ventricular dysfunction and the presence of coronary heart occlusion.

General information

Collection container:

Adults 4.9mL Serum blood tube (Brown top tube).

Paediatrics 1.2mL serum tube (White top tube)

Type and volume of sample: 0.5mL minimum serum aliquot required

Specimen Transport/Special Precautions

All: Separate serum as soon as practicable

External: send serum aliquot (0.5mL minimum) preferable. Send first class post (UK). Send frozen outside UK.

Grossly haemolysed samples are unsuitable for analysis (>5g/L \equiv HI >500)

PIIINP is very stable and shows little loss of activity in serum even at room temperature over 5 days and is stable at 4°C for 10 days. Keep serum at -20°C for long term storage.

Division of Laboratory Medicine

Biochemistry

Laboratory information

Method Principle:

UniQ PIIINP Radioimmunoassay (RIA) (Orion Diagnostica) Kit Ref OR68570

Manual competitive radioimmunoassay where a known amount of radioactively-labelled PIIINP (I^{125}) competes with an unknown amount of unlabelled PIIINP in the sample for a limited number of high affinity binding sites on the antibody. After separation the amount of radioactivity in the bound fraction is inversely proportional to the amount of PIIINP in the sample which can be read against a calibration curve of known amounts of unlabelled PIIINP.

Biological reference range or cut offs: ($\mu\text{g/L}$)

Paediatrics		
13wk	M 46.5-77.6	F 42.4-64.1
26wk	M 24.6-43.3	F 24.7-37.8
39wk	M 14.9-21.4	F 16.2-23.2
1yr	M 11.5-18.9	F 13.7-26.0
2yr	M 7.4-16.0	F 11.2-15.7
3yr	M 5.9-11.0	F 7.2-12.5
10yr	M 5.6-9.9	F 5.6-9.9
11yr	M 6.2-9.4	F 5.5-10.6
12yr	M 5.1-9.4	F 8.2-14.2
13yr	M 6.0-11.9	F 7.1-14.6
14yr	M 7.7-18.8	F 3.0-8.7
15yr	M 8.8-17.0	F 6.5-9.7
16yr	M 11.4-19.7	F 7.2-7.5
17yr	M 7.4-18.0	F 3.0-5.0
18yr	M 3.8-5.9	F 3.0-5.2
Adult		
>18yr	M 1.7-4.2	F 1.7-4.2

Turnaround times: Samples are batched and assayed 2-3/wk. This is a very high demand manual assay. Turnaround time - 21 days (to account for high number of requests and repeat analyses, etc).

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Clinical information

Factors known to significantly affect the results:

Preanalytical: Active erosive arthritis or fractures may raise P3NP.

Analytical: Gross haemolysis may lower results.

Clinical decision points:

Paediatrics

Serum P3NP levels in children may reflect both hepatic fibrinogenesis and also general growth. No guidelines for further investigations are currently available in children.

Adults on Methotrexate therapy

Consider liver biopsy in patients with psoriasis treated with Methotrexate if any of the following conditions is met:

1. Pretreatment P3NP concentration is $>8.0 \mu\text{g/L}$
2. three samples $> 4.2 \mu\text{g/L}$ in twelve month period
3. two samples $> 8.0 \mu\text{g/L}$ consecutively

Consider withdrawing Methotrexate if a patient shows three or more P3NP levels $> 10.0 \mu\text{g/L}$ in any twelve month period.

Active erosive arthritis or fractures may cause raised P3NP levels.

(Last updated March 2018)