

PHC

432 Team

12

DATA INTERPRETATION (II)



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Objectives

► Not Given

Mind Map

Liver Function Test

- Cases

Diabetes

- Case

Comparison between hypoparathyroidism and Rickets

- Cases

Thyroid Function Test

- Cases

Hepatitis.

- Cases

Components of Liver Chemistry Tests:

1- Indicate Hepatocyte Integrity:

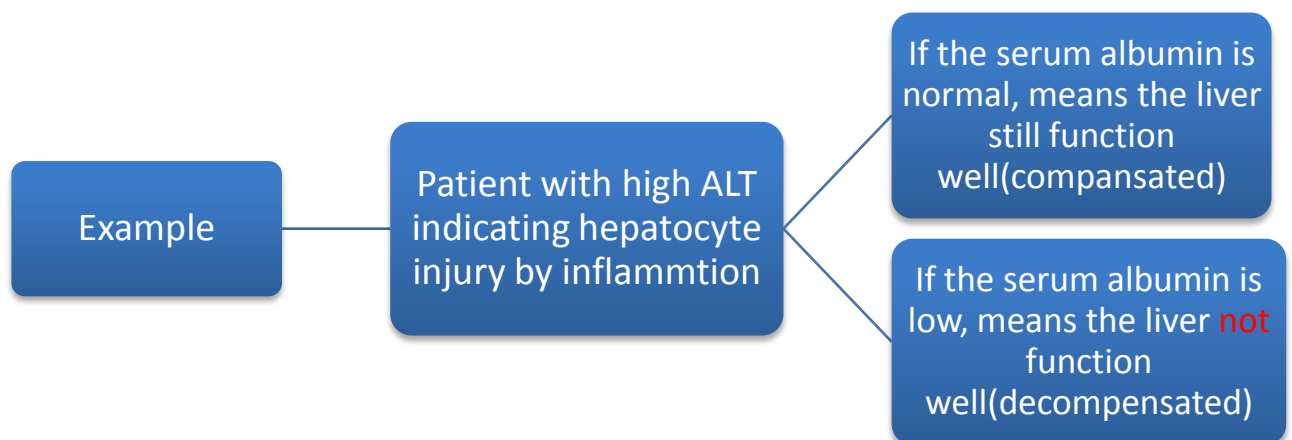
- Alanine amino Transferase **ALT** (Pure liver and the most important one).
- Aspartate amino Transferase **AST** (not specific could rise in muscle damage).

2- Indicate Obstructive Cholestasis:

- Alkaline phosphatase (not specific could rise in bone damage), if the ALT high also, it is more suggestive of liver disease.
- γ -Glutamyl-transpeptidase (could be affected in hepatocyte injury also).
- Bilirubin (Mainly direct indicate obstruction while indirect indicate hemolysis).

3- Indicate Liver Function:

- Serum albumin (indicate decompensation and chronic liver disease).
- Prothrombin time / INR.



▪ **First case: (Common presentation)**

A 40 year old man, came for routine medical check up.

The following LFT is shown below:

Total bilirubin	10	(3- 17 umol/L)
Total protein	73	(60-80 g/L)
Albumin	38	(35-50 g/L)
Alkaline phosphatase	116	(50-136u/L)
Alanine aminotransferase ...	55	(20-65 u/L)
Aspartate aminotransferase ..	27	(10-31 u/L)
G.G. Transferase	198	High (5-55 u/L)

* إذا شفت GGT مرتفع على طول أفكر في Drugs
 * في حالة مرضى ال Epilepsy و كان GGT مرتفع عندهم ما يحتاج أوقف الدواء

Mention two causes for rise of G.G.Transferase Alone?

- Drugs like anti-epileptics e.g. Carbamazepine, **phenytoin most common in KSA**
- Alcohol
- Fatty liver **e.g. Obese patient**

* فقط في هذه الحالات يكون بس GGT المرتفع*

- No need to do anything for this patient – unless there is change in other parameters (e.g. albumin, ...).
- **Treat the underlying cause.**

▪ **Second case:**

A 32 year old man referred from PHC center because of **Jaundice**, LFT done for him as shown: *to detect tinge of jaundice you have to examine the eye with artificial source of white light
 علشان يظهر ال tinge of jaundice في الغالب ال total bilirubin ثلاث مرات أعلى من الطبيعي (< 50) اذا كان اقل من ٥٠ مراح نشوف jaundice

Total Bilirubin..(Mainly indirect)..	57	High	3 – 17 mmol/L
Direct Bilirubin...(almost normal).....	6		0 – 5 umol/L
Total Protein	78		60 – 80 g/L
Albumin	47		30 – 50 g/L
Alkaline phosphatase	69		50 – 136 u/L
Alanine Aminotransferase	63		20 – 65 u/L
Asparate Aminotransferase	31		12 – 37 u/L
Gamma Glutamyltransferase	25		15 – 85 u/L

علشان نعرف اذا هي دايركت و الا اندايركت
 نطرح اللي معطينا اياه
 سواء كان دايركت او
 اندايركت من التوتال
 بيليروبين
 ٥١=٦-٥٧
 اذن قيمة
 الاندايركت=٥١
 و بما انها اكبر من
 الدايركت معناها
 الارتفاع في الاندايركت

How are you going to deal with this gentleman?

- Request CBC and Reticulocytes to roll out **haemolytic anaemia** due to rise indirect bilirubin(**Reticulocytes will be high**).
- If normal so it is mostly due to **Gilbert Syndrome**. *Not need any intervention because it is benign.
 *most likely see it when people fasting (في رمضان)

▪ **Third case:**

A 25 year old man on 4 drug anti-tuberculous treatment. On 2 months follow up visit, he presents with mildly elevated transaminases. Physical examination is unremarkable.

Total bilirubin	10		(3- 17 umol/L)
Total protein	71		(60-80 g/L)
Albumin	37		(35-50 g/L)
Alkaline phosphatase	126		(50-136u/L)
Alanine aminotransferase..(imp)..	99	High	(20-65 u/L) increase 1.5 fold which is mild (below 3 fold not risk)

*more than 3 folds according to reference value used in the hospital considered significant elevation

Aspartate aminotransferase	65	High	(10-31 u/L)
G.G. Transferase	98	High	(5-55 u/L)

What is the most likely diagnosis?

- Drug induced Hepatitis, mostly due to Isoniazide.

* it is known that one of INH drug side effect is elevation in liver enzymes and since it is mild and not significant we don't stop the drug. we follow up 2 months after he is ok and stop the medication.

High ALT and AST and G.G Transferase indicate hepatocytes injury (hepatitis in this case due to anti-tuberculous drug).

- In this case, as long as his LFT is mildly increase, we consider it normal until he finishes his treatment .

▪ **Forth case:(very common presentation)**

A 58 year old asymptomatic woman presents with elevated liver enzymes on routine screening. Her past medical history is significant for HTN, DM 2 and dyslipidaemia. On examination, her BMI is 38 and there is significant acanthosis nigricans on her neck.

CBC	Normal		
U&E	Normal		
Total bilirubin	10		(3- 17 umol/L)
Total protein	69		(60-80 g/L)
Albumin	38		(35-50 g/L) (the liver compensated)
Alkaline phosphatase	146	High	(50-136u/L) (mild=liver injury)
Alanine aminotransferase ...	112	High	(20-65 u/L) (mild=more specific)
Aspartate aminotransferase	61	High	(10-31 u/L)
G.G. Transferase	126	High	(5-55 u/L) (not important here)

Total cholesterol.....6.1
Triglycerides. .. 3.2
INR1.2 (Normal)

Mention two investigations of significance?

- 1- Viral serology B & C (Negative) to rule out hepatitis B&C
- 2- U/S liver (increased echogenicity(fatty liver))

If they didn't mention that he drink alcohol we call it non-alcoholic fatty liver

- Tell the patient to change life style and reduce her weight
- Give Metformin (for DM + fatty liver)

*even in fatty liver without DM we give metformin so if there is DM+fatty liver we should give metformin also we can give statin for fatty liver

What is the most likely diagnosis?

- NAFLD (non-alcoholic fatty liver disease)

▪ **Fifth case:**

A 19 year old girl presents with new onset fatigue, jaundice and mild pruritus. Her past medical history is significant for acne, which is being treated with minocycline for the past 2 months. There is no history of travel or contact with patients with viral hepatitis. On examination there is mild icterus, no organomegaly.

Total bilirubin	Mainly direct 58	High	(3- 17 umol/L) (mild)(obstruction)
Indirect bilirubin5		
Albumin 38		(35-50 g/L)
Alkaline phosphatase346	High	(50-136u/L) (significant high) *almost increased by 3 folds
(obstruction)			
Alanine aminotransferase	...116	High	(20-65 u/L) (mild 1.5 folds)
Aspartate aminotransferase	...91	High	(10-31 u/L)

Viral serology for B and C (hepatitis) is Negative
U/S is within normal

*These are basic investigations we should request

What is the most likely diagnosis?

- Drug induced cholestasis- secondary to minocycline.
Symptoms resolve within 2 weeks of drug discontinuation
Liver profile normalize within 8 weeks.

- We just reassure the patient and stop the medication.
- The patient asks you, when is the jaundice going away? 2 week but repeat investigations after 6-8 week
- Do you know other drugs that can causes cholestasis? OCP, phenothiazenes (antipsychotics), androgens.

▪ **Sixth case:**

A 38-year-old lady presented with 2 weeks H/O yellowish discoloration of sclera together with weakness.

The following investigations are shown below:

Total bilirubin	98	High	(3- 17 umol/L) Both direct and indirect
Indirect bilirubin	43		
Albumin	36		(35-50 g/L) *Indicate Normal liver function (the liver compensate)
Alkaline phosphatase	356	High	(50-136u/L) (significant high)
Alanine aminotransferase ...	316	High	(20-65 u/L) (significant high)
Aspartate aminotransferase ...	291	High	(10-31 u/L) (significant high)
G.G. Transferase	286	High	(5-55 u/L) (significant high)
INR	Normal		*Indicate Normal liver function (the liver compensate)

So the liver is compensating but there is (hepatocytes injury by inflammation+ obstruction)

What are the possible differential diagnosis?

- Viral Hepatitis
- Autoimmune Hepatitis (the diagnosis of this case) *this case is chronic active hepatitis
- Primary biliary cirrhosis. most likely in 45 years old patient or older
- Alcoholic hepatitis
- Drug induced

What are essential investigations needed to help to reach diagnosis?

- Viral markers (screening) for B, C and **A** * we request A here because liver enzymes are very high (significantly increased) and hepatitis A can cause that.
- Ultrasound liver
- Autoimmune antibodies (ANA, Anti mitoch. Ab and Anti smooth musc. Ab)
- Liver biopsy
- We have to admit this patient

▪ **Seventh case:**

A 62-year-old man is a known case of HCV +ve.

The following investigations are shown below:

Total bilirubin	6		(3- 17 umol/L)
Indirect bilirubin	3		
Albumin	23	Low	(35-50 g/L)
uncompensated(impaired function)			
Alkaline phosphatase	180	High	(50-136u/L)
Alanine aminotransferase ..	71	High	(20-65 u/L)
Aspartate aminotransferase ..	77	High	(10-31 u/L)
G.G. Transferase	111	High	(5-55 u/L)
INR	1.36	High	(0.8 - 1.2)
RBC.....	3.08	Low	4.2 - 5.5 X10e12/L
HGB.....	88	Low	120 - 160 g/L
HCT.....	26.7	Low	42 - 52%
MCV.....	86.7		80 - 94 fl
MCH.....	28.5		27 - 32 pg

From CBC, this case is typical case of Normocytic Normochromic Anaemia

What is your diagnosis?

- Chronic liver disease (CLD), uncompensated, post HC virus.
- Normocytic Normochromic Anaemia due to Chronic Liver Disease.

Diagnosis of Diabetes:

(If Fasting Plasma Glucose Test is requested)

FPG \leq 5.5 mmol/L = normal

FPG \geq 5.6 mmol/L to 6.9 mmol/L = Impaired Fasting Glucose

FPG \geq 7 mmol/L = DM

(If Oral Glucose Tolerance Test is requested)

2-h post 75 gm glucose $<$ 7.8 mmol/L = normal GTT

2-h post 75 gm glucose \geq 7.8 mmol/L and $<$ 11.1 mmol/L = impaired GTT

2-h post 75 gm glucose \geq 11.1 mmol/L = DM

▪ **Case:**

A 53-year-old man known case of dyslipidemia. As a routine investigation:

FPG: 6.2 mmol/L
5.9 mmol/L

What is your diagnosis?

- Impaired FPG.

If impaired:
Diet, exercise and
Metformin.

OGTT is requested (FPG and 2 hr post 75 gm glucose)

FPG: 6.9 mmol/L

2 hr: 13.4 mmol/l

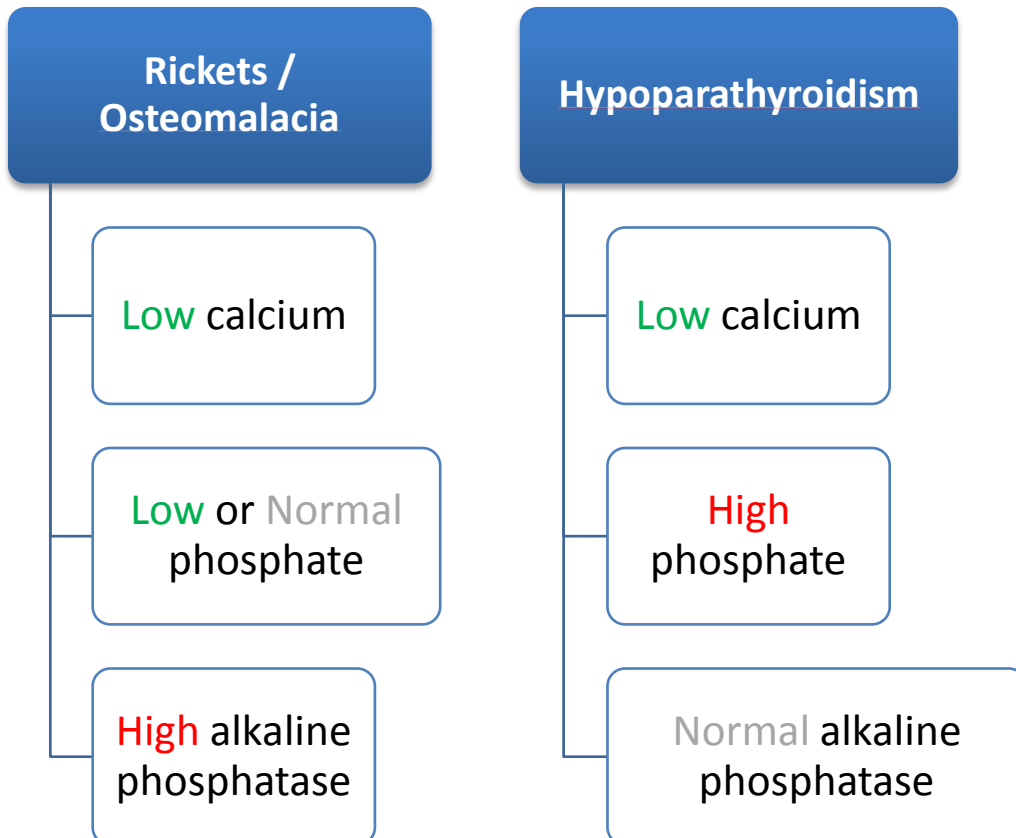
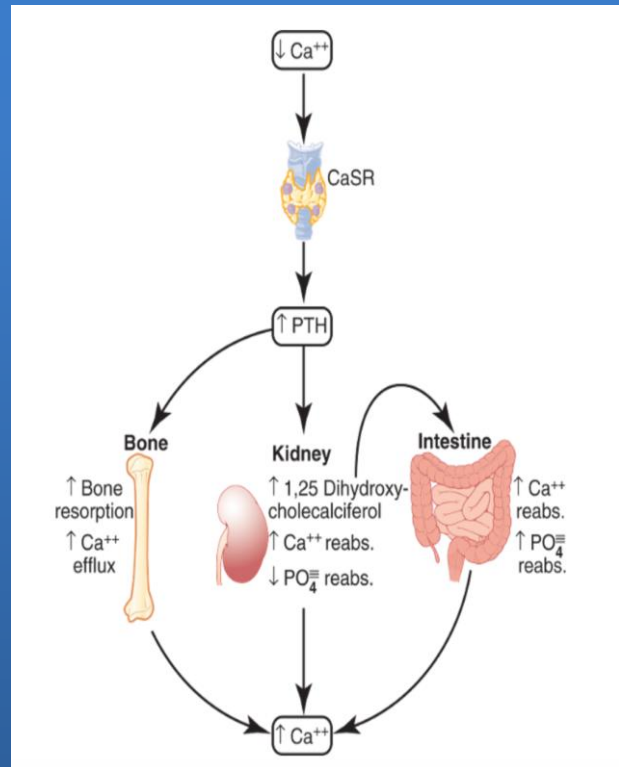
What is your diagnosis?

- Diabetes.

Now HB1c 6.5 and
above is diagnostic

Comparison between hypo-parathyroidism and Rickets:

PTH secretion in response to decreased extracellular fluid calcium ion concentration: (1) PTH stimulates bone resorption, causing release of calcium into the extracellular fluid; (2) PTH increases reabsorption of calcium and decreases phosphate reabsorption by the renal tubules, leading to decreased excretion of calcium and increased excretion of phosphate; and (3) PTH is necessary for conversion of 25-hydroxycholecalciferol to 1,25-dihydroxycholecalciferol, which, in turn, increases calcium absorption by the intestines.



▪ **First case:**

A 70-year-old blind man known case of hypothyroidism+ vitiligo (= autoimmune) and left ventricular dysfunction (this is the most serious and I should care about it first) presents with 2 month H/O SOB, bouts of dry and irritating cough, loss of appetite, hoarseness of voice and low mood. doctor request bone profile

TSH:	0.288 miu/L		(0.25 – 5)
T4:	20.5 pmol/L		(10.3 – 25.8)
Ca.	1.4 mmol/L	Low	(2.10 – 2.55) (very low)
Ph.	1.67 mmol/L	High	(0.74 – 1.30)
Alb.	35 gm/L		(30 – 50)(normal)
Alkaline phosphatase	86 u/l		(50 – 136) (normal)

*Severe hypocalcemia which cause his symptoms

What is your diagnosis?

- Primary hypoparathyroidism. (most likely in this case Autoimmune)

He is known to have hypothyroidism & vitiligo and now diagnosed with hypoparathyroidism this is multi-glandular failure

What is the next investigation of choice?

- Parathyroid hormone 0.353pmol/L Low (1.65 – 6.9) (very low)
*Very Sever deficiency

What is your management?

We should give him high doses of:

- Vitamin D
- Oral Calcium

What other organs or diseases you may screen for?

- Diabetes (FPG)
- Adrenal gland (Cortisol level)

▪ **Second case:**

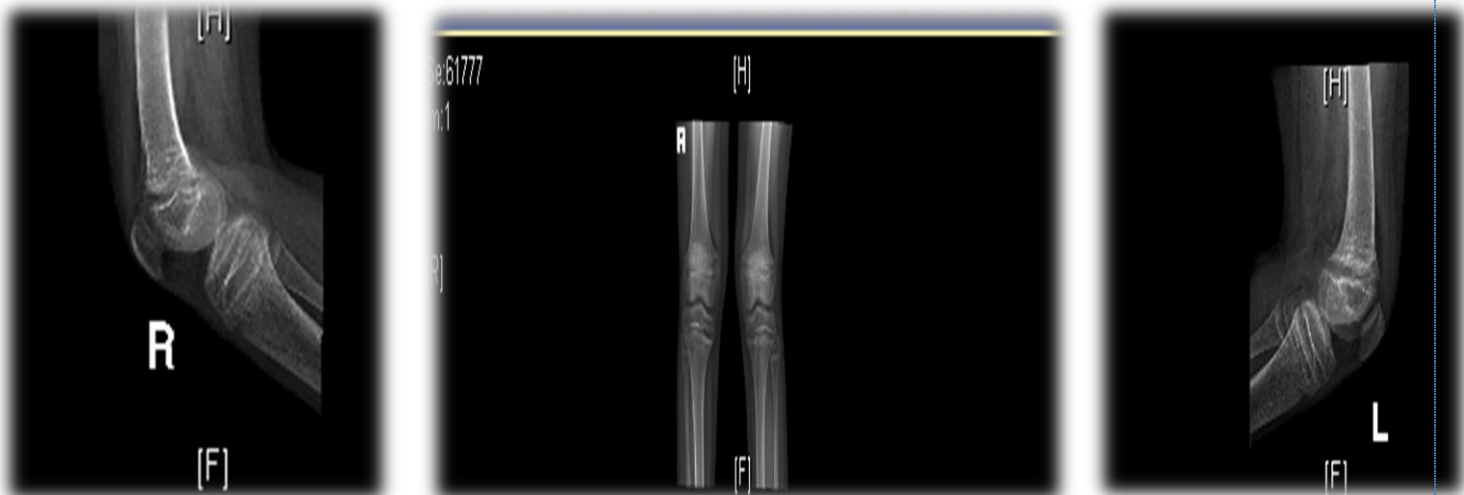
A 14-year-old girl presents with 1 year H/O pain in lower limbs.
 O/E: unremarkable. The following results are shown:

*Doctors think about rheumatic fever but the doctor ask her to sit-down on the floor then stand up she cant stand up without support >> this indicate some sort of proximal myopathies so doctor request bone profile + Vit D

Calcium	1.62	Low	2.10 – 2.55 mmol/L
Corrected calcium...	1.6 (we relay on this)	Low	2.10 – 2.55 mmol/L
Inorganic Phosphorus	1.13		0.87 – 1.45 mmol/L
Albumin.....	39		35 – 50 g/L
Alkaline phosphatase..	1191	High	195 – 476u/L (very high)
Vit D	4.0	Low	nmol/L (very low)

[Defeciency < 25 Insufficiency 25 – 75
 Suffecient 75 – 250 Toxicity > 250]

*To differentiate between rickets and parathyroid we look to Alkaline phosphatase in hypoparathyroidism we never see high alkaline phosphatase except if he had truma



Widened growth plate with fraying, splaying and cupping of the metaphysis Involving both distal both femurs and proximal tibiae and fibulae suggestive of Rickets.

What is your diagnosis and management?

- **Rickets**, we have to give her calcium and Vit D supplements.

She was put on Vit.D3 and calcium carbonate for 2 months. Results were:

Calcium	2.27 (become normal)		2.10 – 2.55 mmol/L
Corrected calcium	2.30 (become normal)		2.10 – 2.55 mmol/L
Inorganic Phosphorus	2.00 (High)		0.87 – 1.45 mmol/L
Albumin	39		35 – 50 g/L
Alkaline phosphatase	687 (still high but now mild)		195 – 476 u/L

▪ **Third case:**

A 15-year-old girl referred to obesity clinic. BMI 34.
The following investigations are shown below:

Test	Result	Unit	Range
<i>Serum - SAMPLE: 1</i>			
1 Prolactin	165.900	MIU/L	102 - 496
2 Lutenizing Hormone	3.150	IU/L	-
3 Follicle Stimulating Hormo	1.550	IU/L	-
4 Para Thyroid Hormone	9.020 H	PM/L	1.65 - 6.9
5 FT4	13.040	PM/L	10.3 - 25.8
6 Thyroid Stimulating Hormo	3.860	MIU/L	0.25 - 5
7 VITAMIN D - T	27.870 L	nmol/L	75 - 250
8 Insulin	103.500 H	MIU/L	2.6 - 24.9
9 Cortisol	194.000	NM/L	193 - 690
10 Vitamin B12	277.800	PM/L	145 - 637
11 Ferritin	97.350	ug/L	13 - 150
12 Folate	25.670 H	NML	4.5 - 20.7

#	Test	Result	Unit	Range
<i>Serum - SAMPLE: 1</i>				
1	C-PEPTIDE	3.560 H	NM/L	0.37 - 1.47
2	Fasting Sugar	4.3	mmol/L	3.3 - 5.5

What is the diagnosis?

- **Hyper**-parathyroidism 2ndry to Vit.D deficiency (in this case there is high Ca and low phosphate not shown in the table)
- Insulin resistance (high insulin+c-peptide) (hyperinsulinemia)C-peptide is precursor of insulin

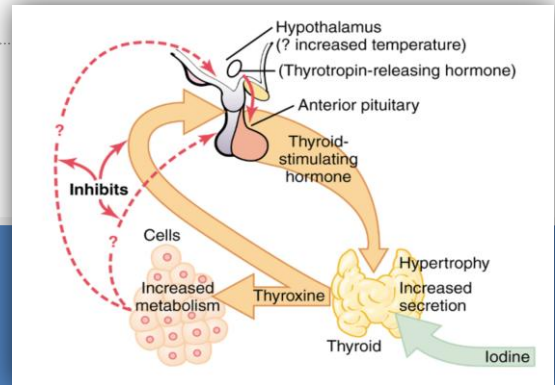
الدكتور جاب سؤال للقرود اللي قبلنا حالة فيها
insulin high and C-peptide also high
which type of diabetes is this ?

- pre-diabetic
 - diabetes type 1
 - diabetes type 2
- Answer is diabetes type 2

_Diabetes type 1 both insulin and c-peptide will be low
_If insulin is high and c-peptide is low that mean patient take insulin injections

Thyroid function test:

Increased thyroid hormone in the body fluids decreases secretion of TSH by the anterior pituitary. When the rate of thyroid hormone secretion rises to about 1.75 times normal, the rate of TSH secretion falls essentially to zero. Almost all this feedback depressant effect occurs even when the anterior pituitary has been separated from the hypothalamus. Therefore, as shown in, it is probable that increased thyroid hormone inhibits anterior pituitary secretion of TSH mainly by a direct effect on the anterior pituitary gland itself. Regardless of the mechanism of the feedback, its effect is to maintain an almost constant concentration of free thyroid hormones in the circulating body fluids.



First case:

A 50 year- old man presents to your office with 6-month H/O of fatigue and weakness. O/E: no objective positive findings.

TSH: 12.2 mIU/l	High	(0.25—5)
FT4: 11.6 pmol/l	normal	(10.3—25 .8)

indicate typical case of subclinical primary hypothyroidism

What is your diagnosis?

- a- Primary Hypothyroidism
- b- Subclinical Hyperthyroidism
- c- Subacute Thyroiditis
- d- Subclinical Primary Hypothyroidism
- e- Secondary Hypothyroidism

If TSH < 10 and asymptomatic:

- Repeat TSH after 6 – 12 months
- Request thyroid antibodies, if high +ve then treat.

Indication of treatment:

- Clinical symptoms
- Presence of goiter
- TSH > 10 mIU/l
- High positive antithyroid antibodies

In this case, TSH>10 And the patient is symptomatic. So treat and start with Thyroxin 25ugm OD Low doses

▪ **Second case:**

A 19-year-old lady presents with 3 weeks H/O a neck swelling discovered incidentally. The swelling move with deglutition and related to left lobe of thyroid and no LN swellings.

She is euthyroid (normal thyroid function).

What is the **most appropriate first step** in management?

- A- TSH and T4
- B- Ultrasound Thyroid
- C- Thyroglobulin antibodies
- D- Fine needle aspiration under U/S guide.**
- E- Technetium thyroid scan

**If the patient younger than 30 y/o or older than 60 y/o we should rule out malignancies that's why we chose D if not clear we refer her to surgery to do excision biopsy*

Technetium-99m pertechnetate thyroid scan is shown. 

Cold nodule of left lobe of thyroid, we have to do fine needle aspiration with the US.

(Note: U/S is requested to see if there is one nodule or more and also to localize the nodule for biopsy)



▪ **Third case:**

A 32-year-old lady, nurse, single presented with one-month H/O palpitation and loss of weight.

O/E: pulse 116 / min Bp 140 / 70

Apart from fine tremors nothing was significant.

The following investigations are shown:

WBC :8.4 ESR :4

TSH: < 0.01 miu/l **Primary** (0.25—5)

FT4: 92.6 pmol/l **Hyperthyroidism** (10.3—25 .8)

Thyroid scan (we do it for all Hyperthyroidism cases): **Reduced iodine uptake**

**this result rule out :
graves
toxic goiter
multi-nodular goiter*

Mention three causes of reduced iodine uptake.

Subacute thyroiditis. (no tenderness)

Post-partum thyroiditis. *could be after 1 year of delivery*

Factitious thyroiditis. (iatrogenic) **most likely the diagnosis.** *this is our case here*

Forth case:

A 42-year-old man booked recently in the clinic. Followed in a private psychiatry clinic because of depression mainly insomnia, weakness and fatigue, on 40 mg Paroxetine. Still not improving, so another antipsychotic drug was added. The patient has good insight and very cooperative.

Mention one investigation of importance for this patient:

- Thyroid function test

TSH: **329.0** mIU/L **High Primary** (0.25 – 5)
 FT4: **2.87** pmol/L **Low Hypothyroidism** (10.3 - 25.8)
 Cholesterol: **9.86** mmol/L **High secondary to hypothyroidism**
 Tri-g: 3.12 mmol/L

- **Fifth case:** *we request FSH and LH because high long time suppression and abnormal secretion of TSH which can convert to pituitary adenoma
 *pituitary adenoma first thing affect the gonadotropins (gonadotropins will be reduced due to swelling of pituitary)
 *we can also request MRI if there is signs of compression (pituitary adenoma)

A 27-year-old man presents with 3 months H/O weakness and tendency to sleep. The following investigation is shown.

very high TSH اعلى رقم شافه الدكتور في حياته

# Test	Result	Unit	Range
Serum - SAMPLE: 1			
1 FT4	0.87	PM/L L	10.3 - 25.8
2 Thyroid Stimulating Hormo	1653.00	MIU/L H	0.25 - 5
3 FT3	1.69	PM/L	3.96 - 6.8
4 Lutening Hormone	2.10	IU/L	-
5 Follicle Stimulating Horm	5.81	IU/L	-

After 1 month of treatment

# Test	Result	Unit	Range
Serum - SAMPLE: 1			
1 FT4	14.69	PM/L	10.3 - 25.8
2 Thyroid Stimulating Hormo	1549.00	MIU/L H	0.25 - 5
3 FT3	1.75	PM/L	3.96 - 6.8
4 Prolactin	549.20	MIU\L H	86 - 324
5 Cortisol	476.40	NM/L	193 - 690
ACTH	8.63	PM/L	

After about 4 month of treatment

# Test	Result	Unit	Range
Serum - SAMPLE: 1			
1 FT4	13.63	PM/L	10.3 - 25.8
2 Thyroid Stimulating Hormo	0.59	MIU/L	0.25 - 5
3 Prolactin	334.80	MIU\L H	86 - 324

- In case of hypothyroidism High TSH stimulate prolactin secretion.

▪ **Sixth case:**

A 30-year-old lady with menstrual irregularities:

TSH: 44.58 mIU/l High Primary (autoimmune in this case) (0.25 - 5)
FT4: 5.58 pmol/l Low Hypothyroidism (10.3- 25.8)
Prolactin: 1499 mIU/l High (102 - 496)

3 months later: (after 100 micgm thyroxin)

TSH: 7.37 mIU/l Decreased but still high (0.25 - 5)
FT4: 10.68 pmol/l Normal (10.3- 25.8)
Prolactin: 1161 mIU/l Decreased but still high (102 - 496)

3 months later: (after 125 micgm thyroxin)

TSH: 2.59 mIU/l Normal (0.25 - 5)
FT4: 12.58 pmol/l Normal (10.3- 25.8)
Prolactin: 1557 mIU/l increased (102 - 496)

MRI sellaturcica: No significant Macro or Microadenoma = **idiopathic prolactinemia**. Idiopathic hyperprolactinemia

Cabergoline (dopamine agonist) was started 0.5 mg once weekly.

▪ **Seventh case:**

A 27-year-old woman presents with one month H/O weight loss, sweating and tremors. She has diffuse neck swelling.

CBC: normal Pulse: 124 bpm ESR: 12 mm/h
TSH: <0.001 mIU/l Low Primary (0.25 -5)
FT4: 139.2 pmol/l High Hyperthyroidism (10.3-25.8)

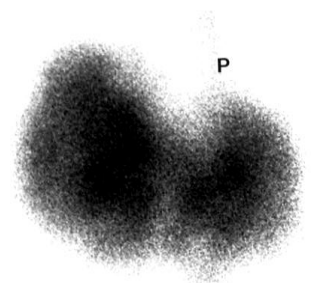
What are the differential diagnosis?

- 1- Graves' disease. Most common cause
- 2- Subacute thyroiditis
- 3- Multinodular toxic goiter
- 4- Toxic nodule /adenoma

Never say FNA unless you had a NODULE.

Mention 1 appropriate investigation to reach the diagnosis:

Thyroid Scan.



▪ **Eight case:**

A 28 year old woman presents to your office with 10 days H/O palpitation, sweating and neck discomfort. O/E: Wet hands and neck tenderness

Pulse: 116/m	Temp. 37.	CBC: normal	ESR: 82 mm/h High
TSH: <0.01 miu/l		Low Primary	(0.25 -5)
FT4: 89.2 pmol/l		High <u>Hyperthyroidism</u>	(10.3-25.8)

What is the most likely diagnosis?

- A- Graves' disease
- B- Subacute thyroiditis (there is neck tenderness AND high ESR)**
- C- Hashimotos thyroiditis
- D- Multinodular toxic goiter

Select one investigation to confirm your diagnosis.

- A- Ultrasound neck
- B- Thyroid antibodies
- C- Free T3 level
- D- Radioactive Iodine thyroid uptake**
- E- Fine needle aspiration

What is the treatment? Choose one or more. *also we can give steroids if there is sever pain!
*don't give carbimazole

- A- L- Thyroxin
- B- B Blockers (for sympathomimetic and reduce pulse rate)**
- C- NSAID (due to inflamed thyroid gland) due to neck discomfort**
- D- Iodine therapy

Previously we have mentioned that **low calcium** and **high phosphate** is a feature of **hypoparathyroidism**, on the other hand **high calcium** and **low phosphate** is a feature of **hyperparathyroidism**

▪ **Case:**

A 52- year- old woman presents to your office with 6 month H/O **polyuria** and **lethargy**. first thing we do if Pt complain of polyuria is glucose check, if normal examine thyroid and request bone profile urgent and parathyroid hormone
O/E: looks **dehydrated and has a neck** swelling (she has the swelling for years and informed to be a simple goiter)

Ca: 3.4 mmol/L	High emergency	(2.1 - 2.6)
Ph: 0.62 mmol/L	Low	(0.8 - 1.4)
Urea: 9.2 mmol/L	High	(2.6 - 6.6)
Chloride: 113 mmol/L	High	(95 - 105)

What is your diagnosis?

Hyperparathyroidism due to parathyroid adenoma (admit the patient, the Ca level is high and could lead to cardiac arrest). they give her IV fluids + lasix



A 48 year old woman presents with 5 month H/O difficulty in raising from sitting position. The following investigation is shown below:

Calcium	1.65 mmol/L	(2.1 - 2.6)
Phosph.	1.52 mmol/L	(0.8 - 1.4)
Alk. Phos.	134 mmol/L	(43 - 154)
Albumen	38 g/L	(35 - 50)

What is your diagnosis?

Hypoparathyroidism

Hepatitis:

The 5 most important markers we care about here are:

1. Hepatitis B Surface antigen it means this patient is infected with HBV.
2. Anti-Hepa B Core IgG means there is a history of exposure at least 6 month or more.
3. Hep-B e Antigen Indicate (high activity), high replication of the virus.
4. Anti- Hepa B e Antigen is Anti body for e virus (indicate low infectivity).
5. Anti- Hepa B Surface means this patient is now immune.

▪ First case:

A 28 year old man, referred from Blood Bank because of being HBsAg positive.

The following HB markers are shown below: النقاط المحددة مهمة في الاختبار

- Hepatitis B S antigen.....(infected).....Positive
- Anti-Hepa B Core IgG(exposure).....Positive
- Hep-B e Antigen Negative
- Anti- Hepa B e Antigen(lowinfectivity).....Positive
- Anti- Hepa B Surface Negative

Chronic history of hepatitis B exposure + viral infection

What is your next step?

LFT, U/S liver, PCR. this is for prepare pt before refer to hepatologist

- ▶ HEPATITIS B DNA QUALITATIVE Positive
- ▶ HEPATITIS B DNA QUANTITATIVE 889796 IU/ML

How are you going to deal with patient?

Measure for Family Contacts, advice

NO blood donation, if married

NO contact, screen the family and referral to hepatologist.

- 1-No blood donation
 - 2-ask if he single or married (if married should do barrier methods)
 - 3-family contact should be screened
 - 4-the ones who negative from people in contact with him should be vaccinated
 - 5-refer to hepatologist
- في الاختبار لازم نكتبها بالتفصيل

▪ **Second case:**

A 35 year old man came to the clinic for screening, as one member in his family is HBV positive.

The following HB markers are shown below:

- Hepatitis B S antigen.....Negative
- Anti-Hepa B Core IgG(exposure)..... Positive
- Hep-B e Antigen Negative
- Anti- Hepa B e Antigen Negative
- Anti- Hepa B Surface(Immune).....Positive

What is your diagnosis?

Immune post exposure to HB virus

How are you going to deal with patient?

Reassurance, No further actions could be taken, NO blood donation.

▪ **Third case:**

A 23-year-medical student came to the clinic for screening.

The following HB markers are shown below:

- Hepatitis B S antigen.....Negative
- Anti-Hepa B Core IgG Negative
- Hep-B e Antigen Negative
- Anti- Hepa B e Antigen Negative
- Anti- Hepa B Surface(Immune).....Positive

What is your diagnosis?

Immune post Vaccination

▪ Forth case: **(Important case)**

A 32-year old man presents to your clinic for routine check up.

The following viral markers are shown below:

- Hepatitis B S antigen.....Negative
- Anti-Hepa B Core IgG(exposure)..... **Positive**
- Hep-B e Antigen Negative
- Anti- Hepa B e Antigen Negative
- Anti- Hepa B SurfaceNegative

Interpret the results.

H/O chronic exposure to HB virus

▶ **What Explanations/options do we have in this case?**

- 1- May be recovering from acute HBV infection (window period). **between the acute infection and complete clearance (antibody no shown yet) ask him to came 6 month later.** If the result is the same after 6 months rule out window period
- 2- May be distantly immune and test is not sensitive enough to detect very low level of anti-HBs in serum. **rule out by PCR if positive it mean he is the same as someone who is post hepatitis**
- 3- May be undetectable level of HBsAg present in the serum and the person is actually a carrier. **Very low viral load,order PCR, if negative he is ok, if positive the virus active.**
- 4- May be a false positive anti-HBc. **Repeatthe test after 6 month if same result it is not false +ve.**

After ordering PCR: he had hepatitis B virus

- ▶ HEPATITIS B DNA QUALITATIVE **Positive**
- ▶ HEPATITIS B DNA QUANTITATIVE <20 IU/ML

Very low viral load, can not be detected in the screening.

Actions:

Measures to Contacts. No blood donation. Not candidate for treatment by e.g. Interferon.

Fifth case: came in previous OSCE exam as case of breaking bad news (council her)

A 26-year-old female came for premarital check up.

The following hepatitis B markers are shown:

she get it when she traveled and visit dentist outside KSA

- Hepatitis B S antigen.....(Infected).....Positive
- Anti-Hepa B Core IgG(exposure)..... Positive
- Hep-B e Antigen(High infectivity).....Positive
- Anti- Hepa B e Antigen Negative
- Anti- Hepa B SurfaceNegative

PCR:

- ▶ HEPATITIS B DNA QUALITATIVE Positive
- ▶ HEPATITIS B DNA QUANTITATIVE >110 million IU/ML

LFT:

Total bilirubin	15	(3- 17 umol/L)
Albumin	39	(35-50 g/L)
Alkaline phosphatase	225	(50-136u/L)
Alanine aminotransferase	960	(20-65 u/L)
Aspartate aminotransferase	296	(10-31 u/L)
G.G. Transferase	235	(5-55 u/L)

What is your diagnosis and what actions are you going to do?

Chronic viral Hepatitis with active replication and highly infectious (e antigen is positive).

The patient came one and half year after treatment

PCR:

- ▶ HEPATITIS B DNA QUALITATIVE Positive
- ▶ HEPATITIS B DNA QUANTITATIVE 31 IU/ML

LFT: Normal

Summary

- **ALT is the most important and specific marker in LFT** which indicate hepatocyte integrity.
- AST indicate hepatocyte integrity but not specific for liver.
- Alkaline phosphatase, G.G.Transferase and direct bilirubin indicate obstructive cholestasis.
- Indirect bilirubin indicate hemolysis.
- Serum albumin, prothrombin time and INR indicate liver function.
- **The main difference between hypoparathyroidism and Rickets is that rickets with high Alkaline phosphatase while it is normal in hypoparathyroidism.**
- In case of neck swelling with normal thyroid function test most appropriate first test to do is fine needle aspiration under US guide.
- We have to do thyroid scan for all cases of hyperthyroidism.
- **Subacute thyroiditis came with neck tenderness and high ESR.**
- High cholesterol level may due to hypothyroidism.
- **Prolactenemia in hypothyroidism due to high TSH.**
- Hepatitis B Surface antigen it means this patient is infected with HBV.
- Anti-Hepa B Core IgG means there is a history of exposure at least 6 month or more.
- Hep-B e Antigen Indicate (high activity), high replication of the virus.
- Anti- Hepa B e Antigen is Anti body for e virus (indicate low infectivity).
- Anti- Hepa B Surface means this patient is now immune.

Questions

- 1) Patient came with high ALT, AST, ALP and G.G.Transferase while the albumin was 23 g/L. This indicate which on of the following?
 - a. Chronic liver disease, compensated.
 - b. Drug induced cholestasis.
 - c. Chronic liver disease, uncompensated.
 - d. Primary biliary cirrhosis.

- 2) Patient came with Low Ca and the phosphate level 1.60mmol/L. What test of choice would you like to order in this case?
 - a. TSH Level.
 - b. Parathyroid hormone level.
 - c. Alkaline phosphatase level.
 - d. Vit D level.

- 3) Patient came for routine check up, on screening only Anti-Hepa B Core IgG was positive. The most appropriate next step is?
 - a. Repeat the test after 6 mounth.
 - b. Order PSR level.
 - c. Reassure the patient.
 - d. Measure for Family Contacts andadvice NO blood donation.

- 4) Patient came with neck swelling that move with deglutition, he has normal thyroid function test. The most appropriate next step is?
- a. Order Ultrasound.
 - b. Order Technetium thyroid scan.
 - c. Reassure the patient.
 - d. Fine needle aspiration under US guide.

432 PHC Team Leaders

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Answers:

1st Questions: C
2nd Questions: B
3rd Questions: B
4th Questions: D