Haematological Emergencies

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Contents

- 5 real life case scenarios
 - Key elements of history & examination
 - Recognise signs & symptoms
 - Investigations
 - Basic pathology
 - Management
- You can always call haem for help and advice!



Case 1

- You are the ED F1
 - 'A haematology patient has spiked a temperature at home'
- What do you want to know?



History

- 70 year old man, known to have DLBCL
- Last had chemo 7 days ago
- Now comes in very lethargic
- Triage obs
 - -T = 38.4
 - BP 91/52
 - P 144
 - Sats 98% o/a
 - RR 20



What are you worried about?

Neutropenic sepsis



What are you going to give?







When are you giving it?

Now!



Definition

- Neutrophils <0.5, or <1 if recent chemo
- Sepsis may not necessarily have a fever
 - Temp >38
 - Feeling 'unwell'
 - Possible focal symptoms of infection

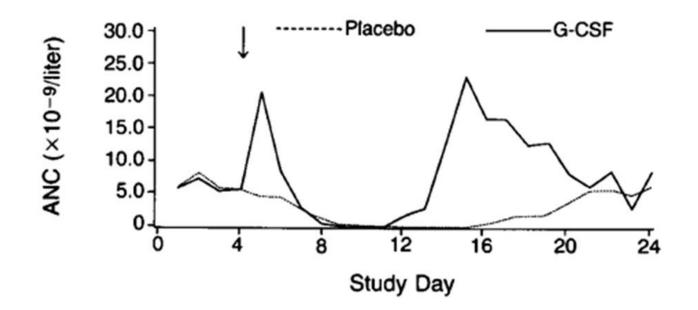


Management

- Common always treat as an emergency
- Never wait for blood results before giving antibiotics – give within 1 hour of presentation
- Follow your local trust protocol
 - Broad spec abx + gram negative cover
- Resuscitate patient, look for source of infection
 - PICC line, mouth/teeth, perianal area
 - DON'T do a PR



Effects of G-CSF





Case 2

- You are the medical SHO on take
- A&E refer a patient 59 year old man presents with back pain, feeling unwell
- Blood results:



Blood results

Results	17/08/2017 7:07
Routine Chemistry	
🗹 Sodium	136 mmol/L
🔲 Potassium	3.6 mmol/L
🔲 Chloride	
🔲 Urea	8.5 mmol/L
🔲 Creatinine	H 167 umol/L
AKI Flag	
🔲 Estimated Glomerular Filtration Rate	* L 37 mL/min
Corrected eGFR	
🔲 Bilirubin (Total)	3 umol/L
🔲 Alkaline Phosphatase	144 iu/L, 144 iu/L
🔲 Alanine Aminotransferase	15 iu/L
🔲 Gamma-Glutamyl Transferase	
🔲 Protein (Total)	
🔲 Albumin	L 30 g/L, L 30 g/
🔲 Calcium	C 3.13 mmol/L
🔲 Calcium (Corrected)	* C 3.19 mmol/L
🔲 Magnesium	
🔲 Phosphate (Inorganic)	1.07 mmol/L
🔲 Amylase	
🔲 C-Reactive Protein	5 mg/L
🔲 Creatine Kinase	
🔲 Troponin I (High Sensitivity)	* 23.2 ng/L

	·
📕 Haemoglobin	L 94 g/L
White Blood Cell Count	5.4 x 10*9/L
Platelet Count	187 x 10*9/L
💷 Mean Corpuscular Volume	96.1 fL
Red Blood Cell Count	L 2.81 x 10*12/L
🔳 Haematocrit	L 0.270 I/I
💷 Mean Corpuscular Haemoglobin	H 33.5 pg
💷 Mean Corpuscular Haemoglobin Conc	348 g/L
Red Cell Distribution Width	12.8 %
Neutrophils	2.5 x 10*9/L
Lymphocytes	2.6 x 10*9/L
I Monocytes	0.3 x 10*9/L
💷 Eosinophils	0.1 x 10*9/L
💷 Basophils	0.0 x 10*9/L
Reticulocytes	
📕 Ret. abs.	
Nuc.RBC count	<0.2 x 10*9/L



What would you do next?

- History
- Examination
- Further bloods
- Imaging
- Special tests for the haematologists



DZ-MICIUYIUUUIIN	
Free light chains	* Free light chain:
🔲 Immunoglobulin A	* L 0.32 g/L
🔲 Immunoglobulin G	* H 39.23 g/L
🔲 Immunoglobulin M	* L 0.17 g/L
Serum Electrophoresis Interpretation	* Serum Electropi
Immunofixation Result	* Immunofixation
🖬 Paraprotein	* 30 g/l.





Spinal cord compression in Multiple Myeloma

- Needs urgent oncology +/- neurosurgical input
- Myeloma diagnosis
 - CRAB
 - Calcium
 - Renal impairment
 - Anaemia
 - Bone involvement
 - Paraprotein/light chains
 - Plasma cells (on bone marrow biopsy)





Case 3

- You are the ward cover F1 called in the evening by biochemistry lab:
 - 'AKI'

	26/09/2019 04:12	26/09/2019 06:41	2
Sodium		130	-
Potassium		4.7	
Urea		15.6	-
Creatinine		207	•
Estimated GFR		29 *	
Calcium		3.46	•
Calcium (albumin-a		3.70	•
Phosphate		1.14	
Total Protein	56	-	
Urate		1,100	^



What further information would you like?

- 48 year old man with probable high grade lymphoma
- Admitted to hospital yesterday
- Hasn't started any chemo yet
- Baseline creatinine = 90
- Suspected diagnosis?

Tumour lysis syndrome



TLS definition

Laboratory tumour lysis syndrome

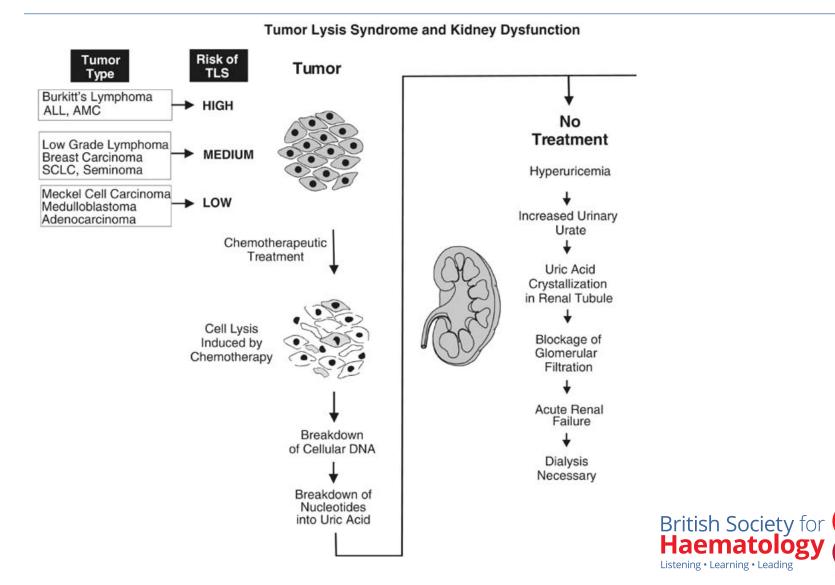
- The presence of ≥2 of the following abnormalities in a patient with cancer or undergoing treatment for cancer, <3 or >7 days of starting treatment
 - Urate ↑
 - Potassium ↑
 - Phosphate ↑
 - Calcium ↓

Clinical tumour lysis syndrome

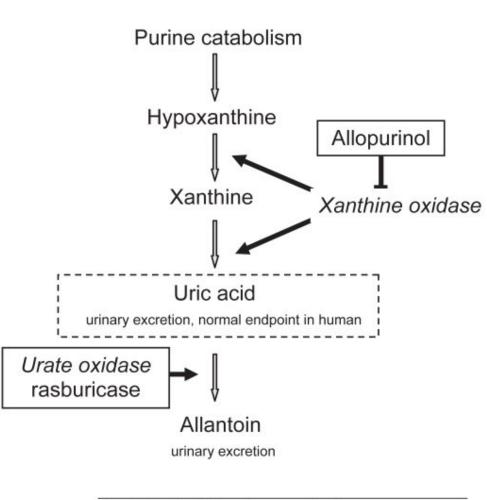
- Laboratory TLS + ≥1 of
 - − Creatinine $\ge 1.5 \times ULN$
 - Cardiac arrhythmia
 - Sudden death
 - Seizure



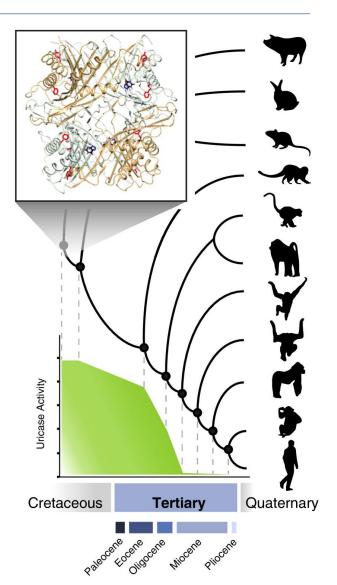
Pathology of TLS



Mechanism of rasburicase







Rasburicase outcome

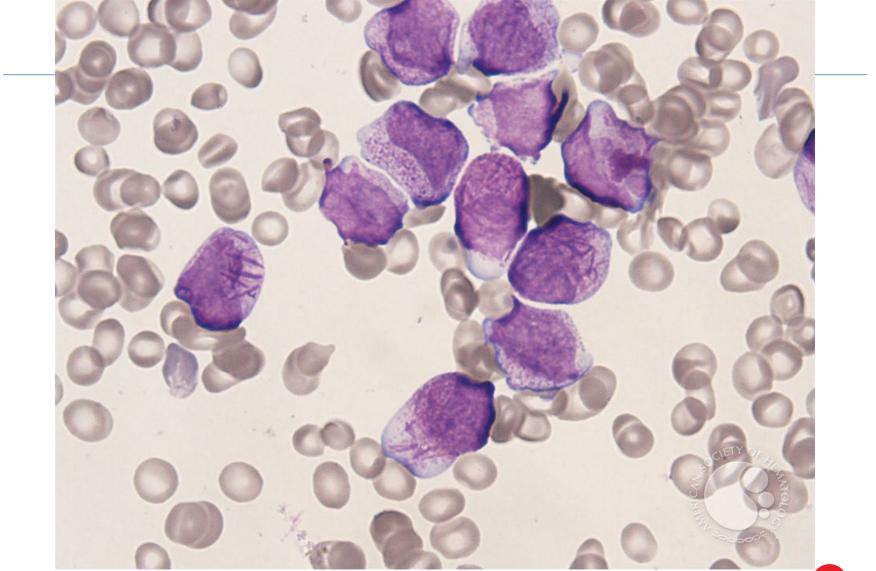
	26/09/2019 04:12	26/09/2019 06:41	7	26/09/2019 11:32		26/09/2019 20:24		27/09/2019 05:02		28/09/2019 03:58		29/09/2019 06:49		30/09/2019 07:15	
Sodium		130	-	129	-	125	-	127	-	129	-	133	-	136)
Potassium		4.7		4.5		4.8		4.8		5.2	•	4.5		3.9	
Urea		15.6	•	15.6	•	17.9	•	19.3	•	24.4	•	13.0	•	12.2	•
Creatinine		207	•	212	*	240	•	244	•	261	•	134	•	111	
Estimated GFR		29 *		28 *		24 *		24 *		22 *		48 *		60 *	
Calcium		3.46	•	3.52	*	3.45	•	3.17	•	2.74	•	2.42		2.17	-
Calcium (albumin-a		3.70	^	3.72	*	3.69	•	3.45	•	3.04	•	2.75	•	2.54	
Phosphate		1.14		1.20		1.88	•	1.79	•	2.13	•	1.32		1.29	
Total Protein	56 🖕			1											
Urate		1,100	•					<12	•	<12	-			28	-



Case 4

- You're the medical SHO on take
- ED refer a 24 year old female with bruising and fevers
 - Hb 89
 - WCC 27.5
 - Neuts 0.84
 - Plts 33
- What is the single most important blood test??
- Who will you call?







Acute promyelocytic leukaemia

- For anyone with suspected acute leukaemia, must send a clotting screen, including fibrinogen!
- Needs urgent haem r/v and treatment
- Manage DIC
 - Keep Fibrinogen >1.5
 - Platelets >50
 - Monitor closely for bleeding!
- Specific treatment?
 - ATRA



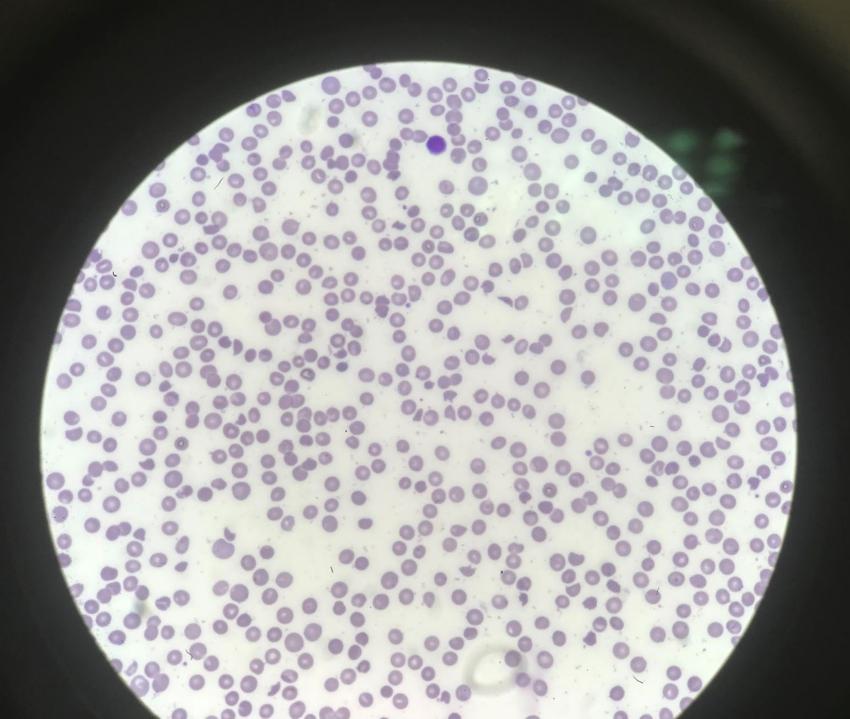
Case 5

- 17 year old male in A&E
- Expressive dysphasia can't say anything other than 'I don't know' and febrile
- Neuro advised to do an LP to r/o encephalitis, but...



Isk3 Isk3 Izk3 Izk3 <thizk3< th=""> Izk3 Izk3 <thi< th=""><th>Results</th><th>06/11/2017</th><th>06/11/2017</th><th>06/11/2017</th><th>06/11/2017</th><th>25/06/2015</th></thi<></thizk3<>	Results	06/11/2017	06/11/2017	06/11/2017	06/11/2017	25/06/2015
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Film Comment Film Comment	Film Comment					





Signs & symptoms

- If you see:
 - 1) Anaemia (specifically MAHA microangiopathic haemolytic anaemia)
 - 2) Thrombocytopenia
 - 3) AKI
 - 4) Confusion
 - 5) Fever
 - Think TTP and call haem urgently!



Thrombotic Thrombocytopenic Purpura

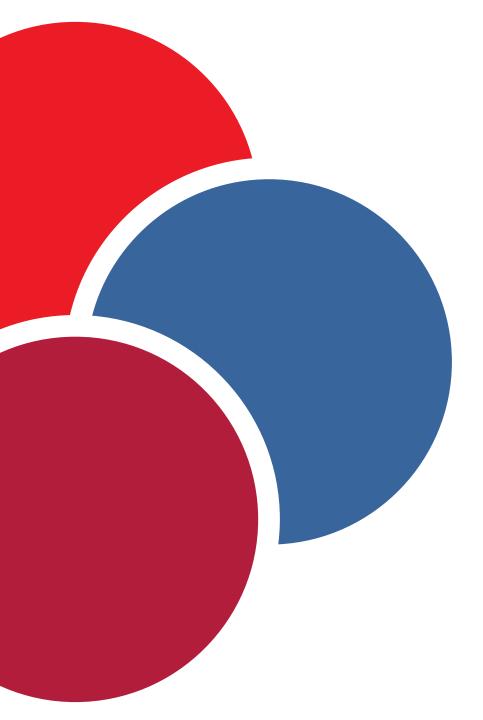
- A true haematological emergency! Needs blue light transfer to nearest TTP centre – 90% die <10 days if untreated!
 - Clotting should be normal
 - Never transfuse platelets!
- Usually autoimmune in nature inhibits ADAMTS13
- Management:
 - Plasma exchange
 - Immunosuppress steroids, rituximab esp if cardiac or neuro involvement
 - Caplacizumab anti vWF Ab



Summary

- Covered:
 - Neutropenic sepsis don't wait for blood results!
 - Spinal cord compression
 - Tumour lysis syndrome
 - Acute promyelocytic leukaemia
 - TTP
- The 2 things haem must get out of bed for are:
 APML
 - TTP
- Clotting is vital to distinguish





Many thanks Any questions?

