

SUMMARY STATISTICS

EQA round: NKDF2/21 - Bone Marrow Aspirate Film

Deadline (EQA round closed): 29.10.2021

Professional supervision: Czech Haematological Society

Key:	>>>	... marks correct (expected) result
	>	... marks conditionally correct (acceptable) result

Patient A

Photo 1

Object no. 1	Nuclear cells - type of cells		1	Granulopoiesis: Neutrophil myelocyte	2,2 %
		>>>	45	Lymphocyte pop.: Lymphocyte	98 %
	Nuclear cells - morphology		1	Granulopoiesis: Neutrophil disgranularity	2,2 %
			1	Granulopoiesis: Nucleocytoplasmatic asynchrony	2,2 %
		>>>	32	Lymphocyte pop.: Normal lymphocyte/plasmocyte	70 %
			1	Lymphocyte pop.: Cytoplasmatic vacuolisation	2,2 %
	>	13	Lymphocyte pop.: Reactive lymphocyte	28 %	
Object no. 2	Nuclear cells - type of cells	>>>	38	Granulopoiesis: Promyelocyte	83 %
			8	Granulopoiesis: Neutrophil myelocyte	17 %
	Nuclear cells - morphology	>	11	Granulopoiesis: Normal finding	24 %
		>	15	Granulopoiesis: Hypo-/agranularity	33 %
			8	Granulopoiesis: Neutrophil disgranularity	17 %
		>>>	13	Granulopoiesis: Cytoplasmatic vacuolisation	28 %
	>>>	13	Granulopoiesis: Nucleocytoplasmatic asynchrony	28 %	
Object no. 3	Nuclear cells - type of cells	>>>	46	Other cells: Macrophage	100 %
Object no. 4	Nuclear cells - type of cells		18	Erythropoiesis: Polychromatophil erythroblast	39 %
		>>>	28	Erythropoiesis: Orthochromatic erythroblast	61 %
	Nuclear cells - morphology		1	Granulopoiesis: Nucleocytoplasmatic asynchrony	2,2 %
			12	Erythropoiesis: Normal finding	26 %
			1	Erythropoiesis: Nucleus karyorrhexis / lobulisation / fragmentation	2,2 %
		>	5	Erythropoiesis: Disturbance of cytoplasmatic haemoglobinisation	11 %
	>>>	28	Erythropoiesis: Howell-Jolly bodies	61 %	
	>	6	Erythropoiesis: Nucleocytoplasmatic asynchrony	13 %	
		5	Erythropoiesis: Microerythroblast	11 %	
Object no. 5	Nuclear cells - type of cells		1	Erythropoiesis: Basophilic erythroblast	2,2 %
		>>>	44	Erythropoiesis: Polychromatophil erythroblast	96 %
	Nuclear cells - morphology		1	Erythropoiesis: Orthochromatic erythroblast	2,2 %
		>>>	29	Erythropoiesis: Normal finding	63 %
		>	14	Erythropoiesis: Disturbance of cytoplasmatic haemoglobinisation	30 %
			1	Erythropoiesis: Nucleocytoplasmatic asynchrony	2,2 %
		2	Erythropoiesis: Macroerythroblast	4,3 %	
		1	Megakaryopoiesis: Normal finding	2,2 %	

Photo 2

Object no. 1	Nuclear cells - type of cells	>>>	41	Granulopoiesis: Promyelocyte	89 %
			4	Granulopoiesis: Neutrophil myelocyte	8,7 %
	Nuclear cells - morphology		1	Granulopoiesis: Neutrophil metamyelocyte	2,2 %
			8	Granulopoiesis: Normal finding	17 %
			2	Granulopoiesis: Hypo-/agranularity	4,3 %
			5	Granulopoiesis: Hypergranularity/toxic granulation	11 %
		4	Granulopoiesis: Neutrophil disgranularity	8,7 %	
	>>>	38	Granulopoiesis: Cytoplasmatic vacuolisation	83 %	
	>	3	Granulopoiesis: Nucleocytoplasmatic asynchrony	6,5 %	
Object no. 2	Nuclear cells - type of cells		1	Granulopoiesis: Neutrophil metamyelocyte	2,2 %
			8	Granulopoiesis: Neutrophil segment	17 %
			1	Granulopoiesis: Atypical granulocyte / myelomonocyte	2,2 %
			1	Lymphocyte pop.: Lymphocyte	2,2 %

Patient A						
Photo 2						
Object no. 2	Nuclear cells - type of cells	>>>	35	Monocyte pop: Monocyte	76 %	
		Nuclear cells - morphology		2	Granulopoiesis: Normal finding	4,3 %
				9	Granulopoiesis: Hypo-/agranularity	20 %
				1	Granulopoiesis: Neutrophil disgranularity	2,2 %
				3	Granulopoiesis: Nucleocytoplasmatic asynchrony	6,5 %
				1	Granulopoiesis: Neutrophil and eosinophil hyposegmentation and acquired Pelger-Huët anomaly	2,2 %
				1	Granulopoiesis: Abnormal chromatin clumping	2,2 %
				1	Granulopoiesis: Pseudo Chediak-Higashi granules	2,2 %
				1	Lymphocyte pop.: Reactive lymphocyte	2,2 %
			>>>	27	Monocyte pop: Normal finding	59 %
				7	Monocyte pop: Atypical/reactive monocyte	15 %
	Object no. 3	Nuclear cells - type of cells		3	Erythropoiesis: Polychromatophil erythroblast	6,5 %
			Nuclear cells - morphology	>>>	43	Erythropoiesis: Orthochromatic erythroblast
					1	Granulopoiesis: Normal finding
				1	Granulopoiesis: Abnormal/leukemic promyelocyte	2,2 %
			>>>	30	Erythropoiesis: Normal finding	65 %
				1	Erythropoiesis: Pycnosis of nucleus	2,2 %
			>	9	Erythropoiesis: Disturbance of cytoplasmatic haemoglobinisation	20 %
			>	3	Erythropoiesis: Nucleocytoplasmatic asynchrony	6,5 %
				1	Erythropoiesis: Microerythroblast	2,2 %
Object no. 4		Nuclear cells - type of cells	>>>	42	Erythropoiesis: Proerythroblast	91 %
	Nuclear cells - morphology			4	Erythropoiesis: Basophilic erythroblast	8,7 %
				1	Granulopoiesis: Normal finding	2,2 %
			>>>	42	Erythropoiesis: Normal finding	91 %
				2	Erythropoiesis: Cytoplasmatic vacuolisation	4,3 %
				2	Erythropoiesis: Macroerythroblast	4,3 %
Object no. 5	Nuclear cells - type of cells	>>>	46	Other cells: Bare nuclei / smudge cell	100 %	
General view and diagnosis						
Cellularity			2	Normocellular	4,3 %	
			1	Hypercellular	2,2 %	
		>>>	43	Hypocellular	93 %	
Granulopoiesis - count		>	14	Within physiological limits	30 %	
			7	Increased	15 %	
		>>>	25	Decreased	54 %	
Granulopoiesis - morphology			2	No significant changes	4,3 %	
			4	Dysplastic granulopoiesis	8,7 %	
		>>>	39	Atypical/toxic granulopoiesis	85 %	
			1	Pathological (clonal) granulopoiesis	2,2 %	
Erythropoiesis - count		>>>	35	Within physiological limits	76 %	
		>	7	Increased	15 %	
			4	Decreased	8,7 %	
Erythropoiesis - morphology			2	Microerythroblastic erythropoiesis	4,3 %	
		>>>	30	No significant changes	65 %	
		>	11	Dysplastic erythropoiesis	24 %	
			3	Atypical erythropoiesis	6,5 %	
Lymphopoiesis - count		>>>	37	Within physiological limits	80 %	
			1	Increased	2,2 %	
			8	Decreased	17 %	
Lymphopoiesis - morphology		>>>	39	No significant changes	85 %	
			6	Reactive changes/irritations	13 %	
			1	Pathological lymphopoiesis	2,2 %	
Monocytopoiesis - count			20	Within physiological limits	43 %	
		>>>	26	Increased	57 %	
Monocytopoiesis - morphology		>>>	44	No significant changes / reactive changes	96 %	
			2	Pathological monocytopoiesis	4,3 %	
Estimation of diagnosis			1	Unable to determine the diagnosis	2,2 %	
			4	Haemophagocytic syndrome (primary, secondary)	8,7 %	
			1	Viral infection (mononucleosis, parvovirus B-19)	2,2 %	
		>	7	Bone marrow failure / aplastic anaemia	15 %	
		>>>	33	Post therapeutic/post infectious changes	72 %	

Patient B					
Photo 1					
Object no. 1	Nuclear cells - type of cells		1	Granulopoiesis: Promyelocyte	2.2 %
		>>>	23	Lymphocyte pop.: Lymphocyte	50 %
		>>>	22	Lymphocyte pop.: LGL (large granular lymphocyte)	48 %
	Nuclear cells - morphology		1	Granulopoiesis: Abnormal/leukemic promyelocyte	2.2 %
		>>>	38	Lymphocyte pop.: Normal lymphocyte/plasmocyte	83 %
			7	Lymphocyte pop.: Reactive lymphocyte	15 %
		>>>	14	Granulopoiesis: Myeloblast	30 %
Object no. 2	Nuclear cells - type of cells	>>>	31	Granulopoiesis: Promyelocyte	67 %
			1	Other cells: Blast, unclassifiable	2.2 %
			4	Granulopoiesis: Normal finding	8.7 %
	Nuclear cells - morphology		2	Granulopoiesis: Hypo-/agranularity	4.3 %
		>	11	Granulopoiesis: Cytoplasmatic vacuolisation	24 %
		>>>	30	Granulopoiesis: Abnormal/leukemic promyelocyte	65 %
		>>>	10	Erythropoiesis: Basophilic erythroblast	22 %
Object no. 3	Nuclear cells - type of cells	>>>	36	Erythropoiesis: Polychromatophil erythroblast	78 %
			1	Granulopoiesis: Abnormal chromatin clumping	2.2 %
	Nuclear cells - morphology	>	17	Erythropoiesis: Normal finding	37 %
		>>>	27	Erythropoiesis: Disturbance of cytoplasmatic haemoglobinisation	59 %
			2	Erythropoiesis: Nucleocytoplasmatic asynchrony	4.3 %
			1	Erythropoiesis: Megaloerythroblast	2.2 %
			1	Erythropoiesis: Intercytoplasmatic bridges	2.2 %
Object no. 4	Nuclear cells - type of cells	>>>	46	Lymphocyte pop.: Plasmocyte	100 %
	Nuclear cells - morphology	>>>	45	Lymphocyte pop.: Normal lymphocyte/plasmocyte	98 %
			1	Lymphocyte pop.: Pathological plasmocyte/plasmablast	2.2 %
Object no. 5	Nuclear cells - type of cells		2	Erythropoiesis: Polychromatophil erythroblast	4.3 %
		>>>	44	Erythropoiesis: Orthochromatic erythroblast	96 %
	Nuclear cells - morphology	>	6	Erythropoiesis: Normal finding	13 %
			1	Erythropoiesis: Nucleus karyorrhexis / lobulisation / fragmentation	2.2 %
		>	9	Erythropoiesis: Pycnosis of nucleus	20 %
		>>>	30	Erythropoiesis: Disturbance of cytoplasmatic haemoglobinisation	65 %
			2	Erythropoiesis: Cytoplasmatic vacuolisation	4.3 %
			1	Erythropoiesis: Howell-Jolly bodies	2.2 %
			9	Erythropoiesis: Nucleocytoplasmatic asynchrony	20 %
			1	Erythropoiesis: Megaloerythroblast	2.2 %
			3	Erythropoiesis: Macroerythroblast	6.5 %
Photo 2					
Object no. 1	Nuclear cells - type of cells		2	Granulopoiesis: Myeloblast	4.3 %
		>>>	43	Granulopoiesis: Promyelocyte	93 %
	Nuclear cells - morphology		2	Granulopoiesis: Hypo-/agranularity	4.3 %
		>>>	42	Granulopoiesis: Abnormal/leukemic promyelocyte	91 %
Object no. 2	Nuclear cells - type of cells	>>>	12	Erythropoiesis: Basophilic erythroblast	26 %
		>>>	33	Erythropoiesis: Polychromatophil erythroblast	72 %
	Nuclear cells - morphology		2	Erythropoiesis: Normal finding	4.3 %
			1	Erythropoiesis: Pycnosis of nucleus	2.2 %
			2	Erythropoiesis: Internuclear bridges	4.3 %
		>	10	Erythropoiesis: Disturbance of cytoplasmatic haemoglobinisation	22 %
			8	Erythropoiesis: Nucleocytoplasmatic asynchrony	17 %
>>>	38	Erythropoiesis: Intercytoplasmatic bridges	83 %		
Object no. 3	Nuclear cells - type of cells	>>>	2	Granulopoiesis: Myeloblast	4.3 %
		>>>	23	Granulopoiesis: Promyelocyte	50 %
			1	Granulopoiesis: Neutrophil myelocyte	2.2 %
			1	Lymphocyte pop.: Prolymphocyte	2.2 %
			13	Lymphocyte pop.: Lymphocyte	28 %
	Nuclear cells - morphology		3	Monocyte pop: Monocyte	6.5 %
			2	Other cells: Blast, unclassifiable	4.3 %
			1	Granulopoiesis: Normal finding	2.2 %
			2	Granulopoiesis: Hypo-/agranularity	4.3 %
			1	Granulopoiesis: Nucleocytoplasmatic asynchrony	2.2 %

Patient B								
Photo 2								
Object no. 3	Nuclear cells - morphology	>>>	22	Granulopoiesis: Abnormal/leukemic promyelocyte	48 %			
			11	Lymphocyte pop.: Normal lymphocyte/plasmocyte	24 %			
			2	Lymphocyte pop.: Reactive lymphocyte	4,3 %			
			1	Lymphocyte pop.: Pathological lymphocyte	2,2 %			
			4	Monocyte pop: Normal finding	8,7 %			
Object no. 4	Nuclear cells - type of cells	>	7	Erythropoiesis: Basophilic erythroblast	15 %			
			>>>	38	Erythropoiesis: Polychromatophil erythroblast	83 %		
	Nuclear cells - morphology	>	1	Granulopoiesis: Cytoplasmatic vacuolisation	2,2 %			
			1	Erythropoiesis: Pycnosis of nucleus	2,2 %			
			>>>	41	Erythropoiesis: Disturbance of cytoplasmatic haemoglobinisation	89 %		
			>	12	Erythropoiesis: Cytoplasmatic vacuolisation	26 %		
			8	Erythropoiesis: Nucleocytoplasmatic asynchrony	17 %			
			1	Erythropoiesis: Megaloerythroblast	2,2 %			
			>	16	Erythropoiesis: Macroerythroblast	35 %		
			General view and diagnosis					
			Cellularity	>>>	25	Normocellular	54 %	
>	20	Hypercellular			43 %			
1	Hypocellular	2,2 %						
Granulopoiesis - count	>>>	34	Increased	74 %				
		12	Decreased	26 %				
Granulopoiesis - morphology	>>>	1	No significant changes	2,2 %				
		2	Dysplastic granulopoiesis	4,3 %				
		43	Pathological (clonal) granulopoiesis	93 %				
Erythropoiesis - count	>>>	4	Within physiological limits	8,7 %				
		1	Increased	2,2 %				
		41	Decreased	89 %				
Erythropoiesis - morphology	>>>	20	No significant changes	43 %				
		22	Dysplastic erythropoiesis	48 %				
		2	Macroerythroblastic erythropoiesis	4,3 %				
		2	Atypical erythropoiesis	4,3 %				
Estimation of diagnosis	>>>	1	Acute myeloid leukaemia - all types according to WHO (excl. APL)	2,2 %				
		45	APL (acute promyelocytic leukaemia)	98 %				

Evaluation of the results - scoring system**NKDF2/21**

Patient A	Photo A1	Photo A2	General view
Maximal achievable score:	60	56	22
Successful participants (success 60 % and more):	35 (it is 76 %)	39 (it is 85 %)	30 (it is 65 %)
Minimal success in this round:	23,3 %	-14,3 %	9,1 %
Maximal success in this round:	93,3 %	100,0 %	100,0 %
Patient B	Photo B1	Photo B2	General view
Maximal achievable score:	60	48	14
Successful participants (success 60 % and more):	38 (it is 83 %)	33 (it is 72 %)	37 (it is 80 %)
Minimal success in this round:	3,3 %	0,0 %	21,4 %
Maximal success in this round:	100,0 %	100,0 %	100,0 %
Number of participants: 46			
Number of the participants that succeeded:	in all 6 tests: 13 (it is 28 %)		
	in 5 tests: 16 (it is 35 %)		
	in 4 tests: 7 (it is 15 %)		
	in 3 tests: 8 (it is 17 %)		
	in 2 tests: 0 (it is 0 %)		
	in 1 test: 2 (it is 4 %)		
	in no test: 0 (it is 0 %)		