MONOCYTOSIS WORKFLOW MANAGEMENT

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A smart solution for monocytosis workflow management

- Reduce unnecessary smear reviews for reactive monocytosis
- Focus on true positive samples
- Save TAT and money
- Follow WHO recommendations
- Improve CMML detection

Monocytosis

Smear recommendations for monocytosis samples define a cut-off greater or equal to 1.5 x 10^3/µL monocytes according to ISLH/GFHC. Reactive cases are most commonly the cause of monocytosis and they are triggered by various origins: infections (viral, bacterial, parasitic), connective tissue disorders, extensive tissue necrosis, among others.

Reactive cases are often suspected for malignancies with monocytosis. The suspicion leads to microscopic examination, and it can thereby generate a high number of unnecessary smears. This has a strong negative impact on the lab workflow.

Once a reactive monocytosis is excluded, a clonal haematopoietic malignancy is usually suspected such as chronic myelomonocytic leukaemia (CMML).

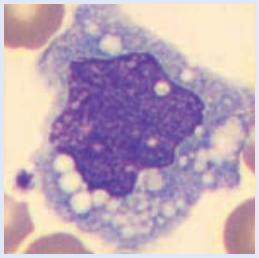

Fig. 1 *Reactive monocyte as seen under the microscope*

Chronic myelomonocytic leukaemia (CMML)

CMML is a rare leukaemia characterised, according to WHO, by a monocytosis greater or equal to 1.0 x 10^3/µL with monocytes greater or equal to 10 % of total white blood cells. Since CMML presents a dysplasia in one or more cell lineages along with the presence of promonocytes and/or blasts in some cases, microscopic examination is crucial.

Manual microscopy of peripheral blood to detect CMML poses challenges too, especially when blasts are not present. The need for alternative techniques for the early detection of CMML are required, and this strongly applies since the risk for acute leukemia to develop is high.

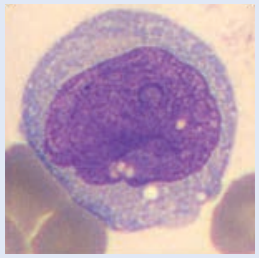

Fig. 2 *Promonocyte as seen under the microscope*

Mono-dysplasia score

The 'mono-dysplasia score'* is an equation developed to optimise the management of smears in samples having monocytosis. It is calculated from three analytical components obtained from the WDF measurement in the search for CMML abnormalities.

Parameters

- Mono #
- Neut #/Mono #
- NE-WX

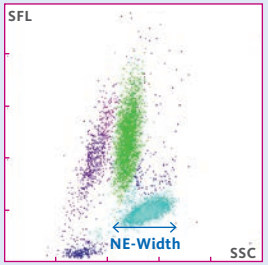

Fig. 3 *Scatterplot showing the dispersion of the neutrophil population from which the NE-WX is obtained*

Performance references

Schillinger *et al.* [1] established and assessed the performance of the 'mono-dysplasia score' to manage microscopic examination of samples with monocytosis. This score was established from a cohort of 696 samples with monocytosis of a reactive or CMML origin. It showed a sensitivity of 96.7% with two FN cases and a specificity of 97.8% with 14 FP for smear reviews. Furthermore, the validation cohort of 1809 samples confirmed these findings. These statistics outperformed those obtained when using the GHFC recommendations. The latter gave a sensitivity of 73.1% and a specificity of 79.2% for smear reviews.

Monocytosis Workflow Optimisation

Sysmex introduces Monocytosis Workflow Optimisation (MWO), a concept designed for samples with monocytosis to optimise the workflow and improve CMML detection.
This is achieved while economising the number of unnecessary smears for samples with monocytosis. MWO combines the 'mono-dysplasia score', the monocyte counts and information from the WBC scattergram to recommend samples for microscopic examination.

*The 'mono-dysplasia score' was developed by a key opinion leader as a result of the mentioned research study and is not CE marked.
[1] Schillinger F *et al.* (2018): A new approach for diagnosing chronic myelomonocytic leukemia using structural parameters of Sysmex XN analyzers in routine laboratory practice. Scand J Clin Lab Invest. 78(3): 159

**'Initial situation or follow-up': first time or in a follow-up after [30 days]

Availability

MWO is an optional rule set available in the *Extended* IPU software version 4.4 and onwards.

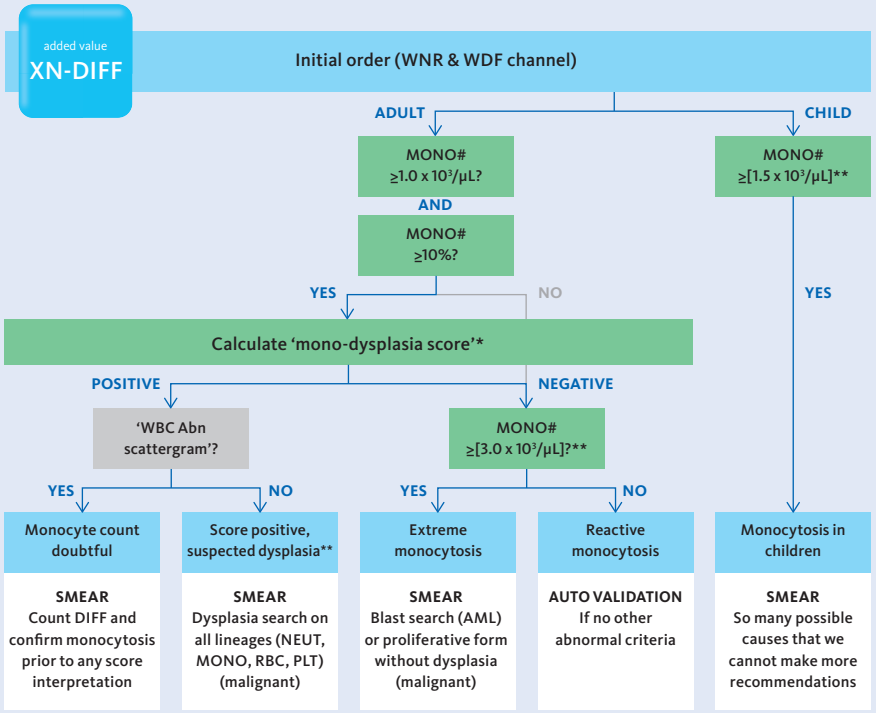

Fig. 4 *MWO rule set in Extended IPU*

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