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Flow cytometry for feline lymphoma: a retrospective study about pre-analytical factors possibly affecting the quality of samples

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Abstract

Flow cytometry (FC) is an increasingly required technique on which veterinary oncologists rely to have an accurate, fast, minimally invasive lymphoma or leukemia diagnosis (Burkhard and Bienzle, 2013). FC has been studied and applied with great results in canine oncology (Comazzi and Gelain, 2011), whereas in feline oncology, the use of this technique is still to be experienced (Guzera *et al.*, 2016). This is mainly due to a supposed discomfort in sampling, because of the high prevalence of intra-abdominal lymphomas (Moore *et al.*, 2012). The purpose of the present study is to investigate whether any pre-analytical factor might affect the quality of suspected feline lymphoma samples for FC analysis.

Ninety-seven consecutive samples of suspected feline lymphoma were retrospectively selected from the authors' institution FC database. The referring veterinarians were recalled and interrogated about several different variables, including signalling, features of the lesion, features of the sampling procedure and the expertise of veterinarians performing the sampling. Statistical analyses were performed to assess the possible influence of these variables on the cellularity of the samples and the likelihood of being finally processed for FC.

None of the investigated variables significantly influenced the quality of the submitted samples, except for the needle size, the 21G needles providing the highest cellularity (Table 1). Notably, the samples quality did not vary between peripheral and intra-abdominal lesions. Sample cellularity alone influenced the likelihood of being processed. About a half of the cats required pharmacological restraint. Side effects were reported in one case only (transient swelling after peripheral lymph node sampling).

FC can be safely applied to cases of suspected feline lymphomas, even for intra-abdominal lesions. 21G needle should be preferred for sampling. This study provides the bases for the spread of this minimally invasive, fast and cost-effective technique in feline medicine.

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Table 1: Cellular concentration of 52 samples of suspected feline lymphoma sent to the laboratory for flow cytometric immunophenotyping, according to the size of the needle used for sampling. Samples collected through 21G needle show the highest cellular concentration.

Needle size (G) [number of samples]	**Cellularity (x 10^3 cells / µl)**			
	Mean ± SD	**Median**	**Minimum**	**Maximum**
18 [6]	12.67 ± 22.92	3.7	0.03	59.26
20 [1]	21.03			
21 [4]	49.61 ± 36.72	51.90	4.75	89.88
22 [30]	9.49 ± 20.61	2.00	0.01	87.54
23 [8]	5.05 ± 8.32	1.83	0.63	21.99
25 [2]	20.19 ± 0.02	20.19	20.17	20.20
27 [1]	19.14			

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