**INTRODUCTION**

Urinary sediment examination is an important diagnostic test for the diseases of the kidneys and of the urinary tract. EQAs are also performed worldwide. The "Urinalysis Performance" managed by the Centre of Biomedical Research (CRB) - an EQA scheme organization with many programs in different fields of Laboratory Medicine - was set up. In 2001, the managing Committee which included the representatives of the three Italian Societies of Laboratory Medicine (AIPaC, SIBioC, SIMeL) and of the Italian Society of Nephrology (SIN), promulgated the "Urinalysis Performance".

This program is the first, and till today, the only Italian project of standardisation of urinary analysis and is conceived with an educational aim. It is conducted on voluntary and confidential basis. The aims of the program are: the evaluation of the laboratories' performances; the training support to the participants; the improvement of the efficiency and efficacy of the urinary sediment examination.

**SCHEME ORGANISATION**

The program includes from the very beginning two parts: one on urinary sediment examination, the other on test strips (data not reported). The part on urinary sediment is under the responsibility and guidance of one of us (G.B.F.), a nephropathologist expert in urinary sediment and urinalysis. Over the years, several aspects of the original design have been modified in order to better fulfill the aims of the program.

Today the program consists in 4 surveys/year:

- **Surveys 1 and 3** Each of these surveys include the shipment of four colour photographs presenting 2 particles. Each particle is shown by both bright-field and phase-contrast microscopy and, when indicated, also by polarized light microscopy. The Participants are asked to identify the urinary elements and for one of them, to indicate one possible clinical association, chosen among 4 or 5 possible options.

- **Surveys 2 and 4** Each of these surveys presents a clinical case which consists in a brief clinical history, some key laboratory data and 4 phase-contrast microscopy images of particles found in the urine sediment of the patient with the clinical case, which, after to identify the urinary elements and to choose one possible clinical diagnosis among 4 or 5 proposed (Figure 2).

**DISCUSSION AND CONCLUSIONS**

The EQA programs which also include the examination of the urinary sediment are few. However, the results obtained by "Urinalysis Performance" show that there is a great need of such programs.

In fact, our program demonstrates that only some particles such as micro-organisms and the most common types of crystals are known to quite all participants. On the contrary, the knowledge of particles such as renal tubular epithelial cells, and lipids is unsatisfactory, especially if one considers the clinical implications they have (Table 1).

Our EQA program improves the skills of the participants, as shown by the results obtained for particles which were presented twice (Table II) and in the results obtained for particles which were presented twice (Table IV). In this respect it is worth noting that the highest and more significant improvements were obtained for particles of clinical importance such as the erythrocytic and leukocytic casts, which are a marker of active glomerular diseases.

Our EQA program is a valuable tool also to expand the knowledge about particles which are known only to specialists. This is clearly demonstrated by the results obtained with the macrophage, which was almost totally misunderstood when it was presented for the first time, but whose correct identification increased by 33.5% when it was presented for the second time (Figure 2).

Our EQA program can also be used as a tool to improve the knowledge of the clinical meaning of particles (Table III) and the knowledge of the clinical implications of the laboratory tests, as demonstrated by the results obtained with the four clinical cases presented (Figure 2).

These results demonstrate that "Urinalysis Performance" EQA Program is a useful training tool to improve urinary sediment examination, and the participation to it should be encouraged and sustained, especially by scientific society of Laboratory Medicine.