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Short Communication

Study Compare of Methods of Proportioning of the Reactive Protein C: Method of Agglutination and Method Immunoturbidimetrique at the Hospital of zone of Suru – Lere, Cotonou, Republic of Benin

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Abstract

On 135 Benin children 0 old to 14 years, of which 56% in the age bracket [0 - 5 years] were selected according to criteria's good determined for the comparison of two methods of proportioning of C Reactive Protein (CRP). The specimens were analyzed by immunoturbidimetry and agglutination with latex on plate. Uses of the two methods, the results obtained are as follows: on 135 samples 105 appeared positive (≥ 6mg/l) with 78% positive for the test of agglutination to latex and 81% for the test immunoturbidimetric. In the same way the test « t » of Student with P < 0,05 revealed a significant difference between the averages of the two methods used.

Keywords: Immunoturbidimetric, CRP, latex, test of student.

Introduction

The ignition is the response of the organization to an aggression having for origin of the physical elements (heat, cold, ionizing rays…) or of the exogenic or endogenous elements solid (pathogenic microbial, insect bite, chemicals) or biological (cytotoxic complexes immunes, antibodies, cytokines…). The ignition can be appreciated through the sedimentation test but also by proportioning of many proteins who's Protein C Reactivates which is a fast protein of kinetics and great amplitude of answer[1-2]. Discovered since the Thirties, the Reactive Protein C arouses the interest of the researchers who successively studied his structure, its various roles as well as the importance of its proportioning by a fast technique. Several methods exist for this proportioning: they are the methods by agglutination, methods by turbidimetry, methods by nephelemetry, methods by immunodiffusion[1-3]. For an efficient choice of method of proportioning, we initiated the present study which aims at comparing two methods of proportioning of the Reactive Protein C: method agglutination on plate and immunoturbidimetric method.

Material and Methods

The study lasted three months. It was carried out on 135 children having CRP like examination requested from the department of pediatric and laboratory of the hospital of zone of SURU-LERE of Cotonou (Benign).

Methods of proportioning of proteins: The test of agglutination was carried out and then the test immunoturbidimetric. CRP was proportioned with commercial reagents of mark BIOLABO by using the plate for the method of agglutination and a Spectrophotometer for the immunoturbidimetric method.

Results and Discussion

Statistical method: The test of Student "T" was used for the comparison of the averages of the two methods. On the 135 children, 56% had between 0 and 5 years. Proportioning by the method of agglutination gave 78% of positivity and that immunoturbidimetric gave 81% of positivity. The averages obtained by the two methods are statistically different with P < 0,05 and also T > t0, (table 1)

Table-1
Comparison of the two methods

Methods	Average	T	to	P
Agglutination	46.17	2.97 1	96	0.003
Immuno Turbidimetric	68.15			

Table 2 summarizes the results obtained by the two methods with VP = 105, VN = 25, FP = 0 and FN = 5.

Table-2
Results obtained by the two methods

		Agglutination		
		Positive tests	**Negative tests**	**Total**
Immuno Turbidimetric	Positive tests	105	5	110
	Negative tests	0	25	25
	Total	105	30	135

From the caused results, we calculated the sensitivity, the specificity and the reliability of the test of agglutination. We obtained a sensitivity of 95%, a specificity of 100% and one reliability of 97,5%.

The characteristics of the method of agglutination are summarized in table 3.

Table-3
Characteristic of the test of agglutination

	Sensitivity	Specificity	Reliability
Values	**95%**	**100%**	**97,5%**

Sensitivity: (positive true positive truths + false negative), Specificity: (negative true negative truths + false-positives), Reliability: (sensitivity specificity X 100).

For the tests of quality control of the immunoturbidimetric method we carried out tests of reproducibility, repeatability and linearity. The test of reproducibility gave coefficients of variation (CV = 5,31%) for high rate and (CV = 4,19%) for average rate, that of repeatability gave (CV= 2. 12%) for high rate and (CV= 3,93%) for the low rate and that of linearity a strong coefficient of linearity (R = 0.995) gave.

CRP is a marker of choice in the early diagnosis of the inflammatory infections. Its proportioning is used to direct the diagnosis of an inflammatory process in particular in the feverish affections of child[4]**.**

The application of the test "T" of student with our study revealed a significant difference between the two methods (T > t0). The test of repeatability is one of the important criteria of the quality control of a method[5]. In a test of repeatability, the coefficient of variation (CV) is the reflection of the relative variability of the results of the proportioning of a biological sample in the same series and must be lower or equal to 5% to validate the méthode.6] That of the immunoturbidimetric method gave of the CV=3.93% for the low rate and CV=2,12% for high rate comparable with those provided by the manufacturer CV=4,06% for the low rate and CV=3,44% for the high rate which are lower than 5%.

The test of reproducibility makes it possible to evaluate the quality and the stability of the reagents; the stability of the serum test during its conservation[7]. That of the immunoturbidimetric method gave of the CV=5,31% for high rate and CV=4,12% for the average rate which are comparable with those of the manufacturer CV=4,29% for average rate and CV=6,60% for the high rate which are close to 5%.

The coefficient of linearity (R = 0.995) for the test of linearity indicates that the optical densities all obtained are in the field of linearity. After These various tests it arises that the immunoturbidimetric method is repeatable, linear and quite reproducible for the median values and not very reproducible for the high values.

The nephelemetry and immunoturbidimetric method are more powerful than the semi-quantitative methods and are used in human medicine of share their many qualities such as the precision, the speed, the quantification and the possibility of being automated[8-9]. The time of proportioning of the serums between the taking away and handling on the one hand and the conditions of storage (rupture of cold) on the other hand would be factors which influence the quality of results[10].

Conclusion

The studies comparing the performances of the two methods for proportioning of CRP showed that the immunoturbidimetric method is more powerful than the method of agglutination. Opposite the urgency of the proportioning of CRP the immunoturbidimetric method is preferable but the method of agglutination can also be useful according to the means available.

Definitions of the Initials: VP = 105, (Positive Value), VN = 25, (Negative Value), FP = 0, (Wrongfully Positive Value), FN = 5 (Wrongfully Negative Value)

References

1. Autier J., Miyara M. and Buyse S., Modulate 8: immunopathology, inflammatory reaction, item112. Issy-les-Moulineaux: Estem, 192 **(2004)**

2. Cackle R., 250 tests of laboratory: regulation and interpretation, Paris: Elsevier Masson, 437 **(2008)**

3. Vaishlavi L., Serum procalcitonin and Creactive protein levels ace markers off bacterial infection: systematic review and meta-analysis has, Repugnant covering joint, **39**, 206-17 **(1996)**

4. Santolaya M.E., Trunk J. and Bérési V., C-reactive protein: avaluable aid for the management off feverish children with cancer and neutropenia, *Repugnant covering joint,* **18,** 589-595 **(2007)**

5. Bernad S., Clinical, Biochimy, Maloine: Paris **(1985)**

6. Yassault A., Dumont G., Labbe Mr., Definition of the quality standards of a method of analysis: the monitor Internet, **26**, 20-33 **(1992)**

7. Eurachem Guides, The fitness for purpose off analytical method validation and related topics, Raven Near: New York, **(1998)**

8. Yamashita K., Fujinaga T., Miyamoto T., Hagio Mr., Izumisawa Y., Kotani T., Relationship between serum cytokine activity and acute phase protein in human, *The Medical newspaper off human Science*, **56(3)** 487-492 **(2006)**

9. Collet B., Proteins of L-ignition, Thesis of Doctorate University, Claude Bernard, Lyon, 39-60 **(1995)**

10. Medeci M.C., Mr. Martinelli, Albonetti V., Chezzi C. and Dettori G., Evaluation off rubella virus immunoglobulin G (IgG) and IgM assays vith of new Videa instrument. Newspaper off Clinical Microbiology, May, Flight 46 N°5, 1847-184 **(2008)**