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# Let's Analyze and Discuss a Series of 50 Patients with Significantly Low HDLc

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**Abstract:** Many studies have proven an inverse correlation between HDL rate and the risk of evolving toward an ischemic heart disease. This study's goal is to spot patients with significantly low HDL to attempt finding new eventual elements characterizing this kind of situation, or at least, affirm the stability of those already acquired. It is a transversal study conducted in the biochemistry and toxicology department at the moulay Ismail Military hospital in Meknes over a one year period (June 2014 – June 2015). The retained patients were ones with an HDL lower than 0.20 g/l. Their medical files were taken from the appropriate services to collect on a record operating the interesting data for the study. 50 patients were taken in. Their average age was 51, 7 year old and the sex ration M/W was 1.4. The infections disease followed half of the cases, malaria being the majority with 32% of cases infections. 28% of cases were patients with cancer, 10% patients with diabetes. 6% were psychiatric diseases and 6% were malnutrition associated with inflammation cases. Hypertriglyceridemia was associated to hypoHDLemia in 46% of cases. HypoHDLemia can be transitory with acute infections and disappear along with it. Nevertheless, it can persist with chronical infections such as viral hepatitis, cancer, diabetes and psychiatric diseases, hence the value of a regular control of the lipid profile.
**Keywords:** Low HDLc, hypertriglyceridemia, heart disease, infection, cancer.

## INTRODUCTION

Many publications have focused on hypercholesterolemia, particularly for its cardiovascular complications. On the other hand, it appears that hypocholesterolemia receives little attention from researchers. It is rare and affects 2 to 5% of the population. It most often relates to the overall cholesterol level, but can sometimes affect only one of its components (HDL or LDL cholesterol). Studies have shown an inverse correlation between the level of HDLc and the risk of progressing to ischemic heart disease [1].Hence the interest to come back to try to characterize clinically and biologically the deficit in this type of lipoprotein.

This study aims to identify patients with HDLc significantly low in an attempt to identify any new elements characterizing such a situation, or at least to affirm the stability of those already acquired. It would also be an opportunity to focus more on the knowledge gained by ensuring to bring them back in another style more assimilable to retain more attention of professionals on this point.

## PATIENTS AND METHODS

This is a study conducted at the Department of Biochemistry - Toxicology of the Moulay Ismail Military Hospital in Meknes over a period of one year (June 2014 to June 2015). The patients selected were those with HDL cholesterol lower than 0.20 g/l .

Their medical records were retrieved at the respective services level to collect on a log file, the data interesting the study. Whenever there was a lack of information, this card was completed by an interrogation with the patient. Patients already known and monitored for dyslipidemia or cardiovascular events were excluded from the study. Biochemical examinations were performed on the Roche-Diagnostics Cobas 6000 controller.

## RESULTS

50 patients were selected, the average age was 51.7 years (Extremes: 23 to 74 years). There is a slight male predominance with a sex ratio (H / F): 1.4. The reasons for hospitalization are shown in Table 1. The infectious pathology accompanied half of the cases; the malaria makes the majority with 32% of the cases of the infections. The cancer patients of the series represent 28% of the cases.

Cases with associated hypertriglyceridemia are shown in Histogram 1. Hypertriglyceridemia was associated with hypoHDLemia in 23 or 46% cases, with a major hypertriglyceridemia at 13.41g / l in a Medizapin patient.

**Table-1: Pathologies accompanying hypoHDLemia**

| Pathology | Number of cases | Percentage of cases (%) |
|---|---|---|
| Infection | 25 | 50 |
| Malaria | 8 | 16 |
| Hepatitis C | 5 | 10 |
| Pneumococcal meningitis | 2 | 4 |
| HIV | 2 | 4 |
| Cholangitis | 2 | 4 |
| Leptospirosis | 2 | 4 |
| Visceral leishmaniasis | 1 | 2 |
| Pulmonary tuberculosis | 1 | 2 |
| Meningococcal meningitis | 1 | 2 |
| Staphylococcus aureus septicemia | 1 | 2 |
| Cancer | 14 | 28 |
| Breast cancer | 6 | 12 |
| Lung cancer | 3 | 6 |
| Rectosigmoid adenocarcinoma | 2 | 4 |
| Bronchial cancer | 2 | 4 |
| Cholangiocarcinoma of the liver | 1 | 2 |
| Renal adenocarcinoma | 1 | 2 |
| Diabetes | 5 | 10 |
| Psychiatric disorder | 3 | 6 |
| Bipolar disorders | 2 | 4 |
| Schizophrenia | 1 | 2 |
| Undernutrition and inflammation | 3 | 6 |

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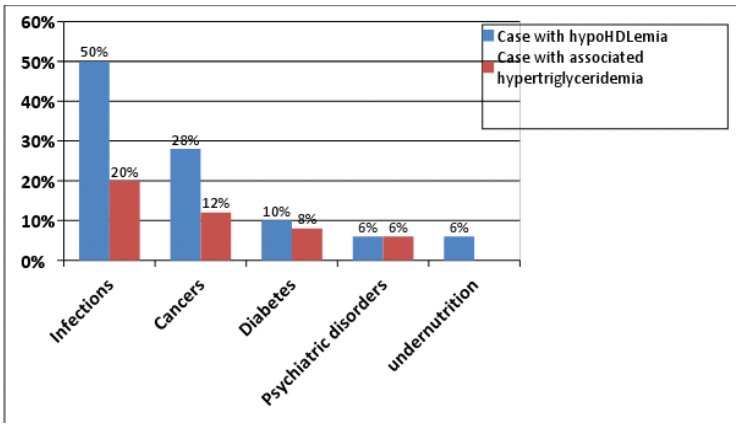


**Fig-1: Cases of hypoHDLemia with cases of associated hypertriglyceridemia**

Hypertriglyceridemia was associated with hypoHDLemia in 23 cases, ie 46%, with major hypertriglyceridemia at 13.41g / l in a Medizapin patient

## DISCUSSIONS

Various epidemiological studies have already shown that a significant decrease in HDLc generates cardiovascular risks [2, 3]. Hypertriglyceridemia alone is not involved. However, when they occur on an HDL deficient ground, their share in cardiovascular disease becomes significant.

In addition to primary lesions, HDL declines are mainly associated with infectious diseases [4,5]. The association with hypertriglyceridemia during the acute phase of a bacterial infection or fever has also been reported. The latter is explained by the inhibition of lipoprotein lipase essentially under the influence of TNF and IL1, thus preventing the lipolysis of triglyceride-rich particles, thus leading to hypertriglyceridemia and lowering of the fraction. HDL2 cholesterol [4, 5].

The series studied in this work is of the same profile. In fact, 50% of patients were treated for an infection, the majority of which was malarial (32%).

This finding has already been reported by Lambrecht *et al*. who observed in the late 1970s the absence of HDLc in 6 patients infected with Plasmodium vivax [6]. The mechanism has been linked to inhibition of LCAT (lecithin cholesterol acyl transferase) protein transporting cholesterol esterified to the liver and lipoprotein lipase that participates in the synthesis of HDLc, by plasmodium or its byproducts. This inhibition is also seen in hepatitis C [7].

Of the 50 patients in the series, 23 (46%) had associated hypertriglyceridemia. The pathologies identified as the cause of this dual disorder were mainly infections (40% of infections) and cancers (42% of cancers). The chronic viral infections appear sufficiently in the series as generating decreases of the HDLc: 5 cases of hepatitis C of which 2 with hypertriglyceridemia, 2 cases of AIDS both with hypertriglyceridemia associated. This profile is found in the literature on dyslipidemia related to viral infections [8-11].

The cancerous pathology gives drops in cholesterol and particularly in its HDL fraction [12]. Cancer cells use large amounts of macromolecules and lipids to proliferate, leading to a deficit in these molecular structures [13-15]. Our study has objectified results in the same direction. Indeed, 28% of the series were cancerous. Type 2 diabetes was 20%. This pathology is characterized by a very high frequency of lipid abnormalities mainly a decrease in HDLc. This can be explained by the increased catabolism of HDL [16]. The possibly associated hypertriglyceridemia is essentially related to the increase in liver production of VLDL following insulin resistance. It is also due to a decrease in their catabolism, due to the decrease in the activity of lipoprotein lipase [7].

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## CONCLUSION

The fall in HDLc is due to several pathological situations. From a frequency point of view, we find mainly infections and cancers. This decline is to be considered in several respects. First, it can be transient and therefore less disturbing if it occurs during an acute infection and disappear with it. Then, it can be persistent and thus generating or aggravating a cardiovascular risk. This is the case of chronic conditions such as viral hepatitis, cancer, diabetes and psychatric diseases. Attention should be paid particularly to situations where other metabolic disorders accompany the decline in HDL. This is the case of diabetes, psychiatric disorders where there are associated increases in TG, LDLc and Lp (a) seriously atherogenic lipoproteins.

## REFERENCES

1. Guinchard-Foulon, E., Rodriguez-Lafrasse, C., & Rousson, R. (2003). HDL-cholesterol: role of its dosage in the assessment of cardiovascular risk. In *Annales de biologie clinique* (Vol. 61, No. 5, pp. 549-556).
2. Brown, J. M., & Rudoni, S. (1999). Dyslipidemias. Encyclopedia Med Chir (Elsevier, Paris). *Angeiology*, 19-0110, 9.
3. Choi, S. J., Park, S. H., & Park, H. Y. (2011). Increased prevalence of low high-density lipoprotein cholesterol (HDL-C) levels in Korean adults: Analysis of the three Korean national health and nutrition examination surveys (KNHANES 1998–2005). *Osong Public Health and Research Perspectives*, *2*(2), 94-103.
4. Bentz, M. H., & Magnette, J. (1998). Hypocholesterolemia during the acute phase of an inflammatory reaction of infectious origin. 120 cases. *La Revue de medecine interne*, *19*(3), 168-172.
5. Chagnon, A. (1999). Contribution of certain biological anomalies to the diagnosis of malaria. *Med Mal Infect*, *29*(3), 302-6
6. Lambrecht, A. J., Snoeck, J., & Timmermans, U. (1978). Transient an-alpha-lipoproteinaemia in man during infection by Plasmodium vivax. *The Lancet*, *311*(8075), 1206.
7. Fredenrich, A. (2010). Secondary dyslipidemias. EMC (Elsevier Masson SAS, Paris), *Endocrinology-Nutrition*, 10-368-F-10,
8. Boccara, F., Capeau, J., Caron, M., Vigouroux, C., & Cohen, A. (2009). HIV, antiretrovirals, dyslipidemia and cardiovascular risk. *Metabolic Mal Medications*, *3* (1), 59-64
9. Sawadogo, M., Sakande, J., Kabre, E., & Sougué. M. (2005). Lipid profile during HIV infection in Ouagadougou-Burkina Faso: interest of lipid markers in monitoring the evolution of HIV infection. *Ann Biol Clin*, *63* (5), 507-12
10. Muhammad, S., Sani, M. U., & Okeahialam, B. N. (2013). Prevalence of dyslipidemia among human immunodeficiency virus infected Nigerians. *Ann Afr Med*, *12* (1), 24-8.
11. Vu, C. N., Ruiz-Esponda, R., Yang, E., Chang, E., Gillard, B., Pownall, H. J., ... & Balasubramanyam, A. (2013). Altered relationship of plasma triglycerides to HDL cholesterol in patients with HIV/HAART-associated dyslipidemia: further

evidence for a unique form of metabolic syndrome in HIV patients. *Metabolism*, *62*(7), 1014-1020.

12. Chang, S. J., Hou, M. F., Tsai, S. M., Wu, S. H., Ann Hou, L., Ma, H., ... & Tsai, L. Y. (2007). The association between lipid profiles and breast cancer among Taiwanese women. *Clinical Chemical Laboratory Medicine*, *45*(9), 1219-1223.
13. Lincet, H., Kafara, P., Giffard, F., Abeilard-Lemoisson, E., Duval, M., Louis, M. H., ... & Icard, P. (2013). Inhibition of Mcl-1 expression by citrate enhances the effect of Bcl-x L inhibitors on human ovarian carcinoma cells. *Journal of ovarian research*, *6*(1), 72.
14. Icard, P., Kafara, P., Steyaert, J. M., Schwartz, L., & Lincet, H. (2014). The metabolic cooperation between cells in solid cancer tumors. *Biochimica et Biophysica Acta (BBA)-Reviews on Cancer*, *1846*(1), 216-225.
15. Bielecka-Dąbrowa, A., Hannam, S., Rysz, J., & Banach, M. (2011). Malignancy-associated dyslipidemia. *The open cardiovascular medicine journal*, *5*, 35.
16. Isomaa, B. O., Almgren, P., Tuomi, T., Forsén, B., Lahti, K., Nissén, M., ... & Groop, L. (2001). Cardiovascular morbidity and mortality associated with the metabolic syndrome. *Diabetes care*, *24*(4), 683-689.
17. Hayes, M., Östlin, G., Schaerer, D., Verhamme, A., Mas-Hesse, J. M., Adamo, A., ... & Herenz, E. C. (2013). The Lyman alpha reference sample: Extended Lyman alpha halos produced at low dust content. *The Astrophysical Journal Letters*, *765*(2), L27.
18. Ezzaher, A., Haj, M. D., Mechri, A., Neffati, F., Douki, W., Gaha, L., & Najjar, M. F. (2010). Obesity and dyslipidemia in Tunisian bipolar subjects. In *Annales de biologie clinique* (Vol. 68, No. 3, pp. 277-284).
19. Lieberman, J. A., Stroup, T. S., McEvoy, J. P., Swartz, M. S., Rosenheck, R. A., Perkins, D. O., ... & Severe, J. (2005). Effectiveness of antipsychotic drugs in patients with chronic schizophrenia. *N Engl j Med*, *2005*(353), 1209-1223.
20. Mabrouk, H., Mechria, H., Hellara, I., Ben Omrane, C., Neffati, F., Mechri, A., ... & Najjar, M. F. (2012). Lipid profile and cardiovascular risk in 121 schizophrenic patients. *Immuno-Analyse & Biologie Specialisee*, *27*(4), 159-167.