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Why So Many Negative Coproculture? About 2329 Corocultures Carried Out at the Charles De Gaulle Pediatric Hospital Center in Hospitalized Children Aged 0 To 5 Years Old

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ABSTRACT

Introduction: *Clinical syndromes of digestive expression or various origins, infectious diarrhea is a major public health problem in children in tropical countries.*

Methodology: *This was a descriptive retrospective study aimed at analyzing the epidemiological and microbiological aspects of the stool cultures carried out in children aged 0-5 years hospitalized at CHUP-CDG from January 2010 to December 2015.*

Results: *Out of 2329 stool cultures performed, we found a positivity rate of 4.12% with a predominance of requests in the infant service.*

With regard to the bacteria isolated, enteropathogenic Escherichia coli came first with 19 cases, then Salmonella spp with 10 cases and Shigella spp with 2 cases. Candida albicans were isolated in 30 cases and Candida spp in 33 cases.

The frequency of parasites was 7.17% and that of Rotavirus / Adenovirus 44.12% (out of 68 virus search requests). 452 patients were on probabilistic antibiotic therapy out of 465 patients (97.20%) with a predominance of the combination ceftriaxone + gentamycin (87.6%). Also there were no suitable isolation media for germs such as as Yersinia, Campylobacter, and Clostridium.

Conclusion: *In view of all the above, there is a need to review the indications and the practical conditions for carrying out this technique in tropical environments with limited resources.*

Keywords
Diarrhea, Stool culture, CHUP-CDG, Children.

Introduction
Diarrhea is one of the main causes of morbidity and mortality among children in developing countries where hygiene conditions are precarious. Infectious diarrhea is a major public health problem in children in tropical countries. WHO estimates 1.3 billion cases of diarrhea each year worldwide. It is the second leading cause of death in children under 5 and causes 760,000 deaths per year from dehydration [1].

WHO estimates in 2010 showed that of the 4.199 million deaths among children under 5 in Africa, 19% were attributable to Rotavirus infections causing severe acute diarrhea. These infections affect 90% of children 2 years old annually. In Burkina Faso, diarrhea ranks third in terms of morbidity and mortality in children aged 5 years, after malaria and acute respiratory infections. Stool culture is the main diagnostic test for diarrhea. This is the bacterial culture of stool in order to isolate and identify the bacterium (s) responsible for intestinal infections and to determine its / their sensitivity to antibiotics [2].

However, in recent years the frequency of negative stool cultures has been increasing. In 2004, a study on acute diarrhea in children showed that 80.20% of stool cultures were negative [3-5]. In 2006, a study on the etiologies of acute diarrhea in children aged 0 to 5 at CHUP-CDG showed that 83.5% of stool cultures were negative [6]. Another in 2014 on acute diarrhea in children in hospitals in Burkina Faso revealed 87.4% of stool examinations negative [7].

Did these negative stool cultures really reflect an absence of bacterial infections? What are the factors influencing the results of negative stool cultures?

Our study consists of an analysis of the stool cultures carried out in children aged 0 to 5 years hospitalized at the Pediatric University Hospital - CHARLES DE GAULLE from January 2010 to December 2015 in order to improve laboratory diagnosis for more appropriate therapy.

Methodology
This was a retrospective descriptive study over a period of 6 years, from January. 2010 to December 2015.

The bacteriology section of the biomedical analysis laboratory and the clinical services of the CHUP-CDG served as a study framework. Our study population consisted of patients aged 0 to 5 years hospitalized at the CHUP-CDG in whom a stool culture was performed in the biomedical analysis laboratory.

The data were collected from a form developed to collect and then entered and analyzed using Excel version 2010 software. Pearson's Chi-square statistical test was performed on Epi info 6 software and was considered as statistically significant when p was less than 0.05.

Results
During our study from January 2010 to December 2015, 2329 stalk cultures were performed. Of this total, 96 were positive or 4.12% and 2233 were negative or 95.88%. However, only 487 complete files were found.

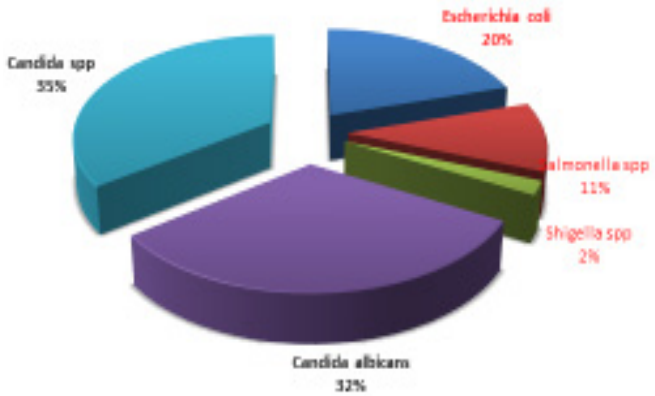
There is a great predominance of requests for stool cultures in children from 0 to 1 with 66.98%. The same age group recorded the highest percentage of positive stool cultures with 2.40% followed by children from 1 to 2 years old with 1.29% (p = 10-6). As shown in Table 1.

Table 1: Frequency of positive coprocultures according to age.

Age groups	Number of coprocultures		Number of positive coprocultures	
	Effective	**Frequency**	**Effective**	**Frequency**
[0-1]	**1560**	**66,98 %**	**56**	**2,40 %**
[1-2]	**523**	**22,58 %**	**30**	**1,29 %**
[2-3]	146	6,27 %	5	0,21 %%
[3-4]	50	2,15 %	3	0.13 %
[4-5]	50	2,15 %	2	0,09 %
Totals	2329	100 %	96	4.12 %

This distribution shows a female predominance with a sex ratio of 0.89. However, there was no statistically significant difference between the prevalence of positive stool cultures in boys and girls, ie 4.35% versus 3.89% respectively; p = 0.58.

Figure 1: Frequency of germs isolated in stool culture.



Out of 2329 stool cultures 167 revealed the presence of parasites, ie 7.17%. As shown in Table 2.

Table 2: Frequency of parasitic species.

parasite species	Number of parasites found	
	Effective	Fréquency
Entamoeba	**87**	**3,74 %**
Giardia lamblia	**49**	**2.10 %**
Trichomonas intestinalis	**23**	**0,99 %**
Entamoeba + Giardia lamblia	3	0,13 %
Entamoeba + Trichomonas intestinalis	2	0,08 %
Giardia lamblia + Trichomonas intestinalis	2	0,08 %
Blastocystis hominis	1	0,04 %
Total	167	7,17 %

The greatest frequency was represented by amoeba with 3.74% of cases followed by giardia lamblia with 2.10% of cases.

Out of 2,233 negative stool cultures, only 68 were screened for Rotaviruses and Adenoviruses simultaneously. Thirty were positive for Rotavirus and / or Adenovirus, i.e. 44.12%.

Out of 465 negative stool cultures, 452 patients were on probabilistic antibiotic therapy, ie 97.20% of cases. The vast majority of children were on the combination ceftriaxone + gentamycin (Figure 3).

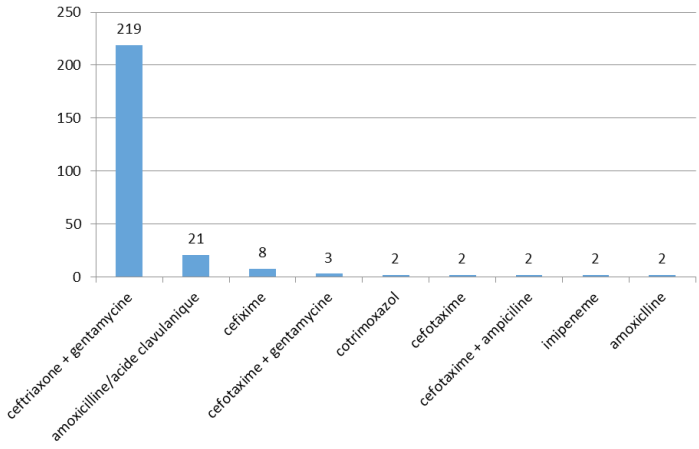


Figure 2: Most Used Antibiotics.

Discussion

Out of 2329 stool cultures, 96 were positive or 4.12%. Our frequency is lower than those of OUEDRAOGO at CHUP-CDG in 2006, which found respectively 16.5% of positive co-cultures. This shows the low frequency of positive faecal cultures in general [6].

The highest frequency of positive stool cultures was recorded in the same age group with 2.40% in our study, as was that of DEMBELE at the CHU / Gabriel TOURE (MALI) in 2008 [8] and that of OUEDRAOGO at the CHUP -CDG in 2006 [6].

Indeed, at these ages, infants (from 3 months) are no longer protected by maternal antibodies and have not yet acquired serum antibodies; which makes them more vulnerable to infections. Also in this age group, there is an increase in so-called weaning diarrhea.

We noted a predominance of girls with a sex ratio of 0.89. This could be explained by the high proportion of females in the general population: there was no statistically significant difference between the prevalence of positive stool cultures in boys and in girls.

On 96 positive stool cultures we found 20% of *Escherichia coli* Enteropathogenic¸ 11% of *Salmonella spp*, 2% of *Shigella spp*, 32% of *Candida albicans* and 35% of *Candida spp*. Our results are lower than those of SALOU at CHUP-CDG in 2004, which found 57.69% of *Escherichia coli*, 30.76% of *Salmonella* and 11.55% of *Shigella*. These results show, in the same order, Escherichia coli in the first line followed by *Salmonella spp* and *Shigella spp*.

Enteropathogenic *Escherichia coli* is responsible for endemic diarrhea in children (under 2 years of age) in developing countries, favored by poor hygiene. Salmonella diarrhea is more common in developing countries and is believed to be linked to poor hygienic conditions.

The high frequency of Candida and the low frequency of bacteria could be explained by probabilistic antibiotic therapy by self-medication and / or by inappropriate prescription, most of the children having gone through the periphery (CSPS, CMA), where they would have received treatments. unsuitable, before being referred to the CHU.

Our study showed a frequency of parasitic infections at 7.17%. Amoeba tops the list with 3.54%. This frequency is lower than that of NITIEMA et al. at the St Camille Medical Center (Ouagadougou) [9] in 2011 which found 18.8% of parasitic infections. This difference is explained by the fact that NITIEMA et al. carried out more in-depth parasitological examinations of the stool (after concentration, enrichment, staining) for the detection of parasites, whereas in our study the parasites were found in the fresh state.

Parasites are more common in children over 24 months. This is due to the oral transmission of parasites through contaminated food and water. SIMPORE et al. at CM St Camille in 2009 found 15.89% [10].

Out of 68 virus search requests, at least 27 were positive for Rotavirus, or 39.71%. This frequency is higher than those of NITIEMA et al. at the St Camille Medical Center (Ouagadougou) in 2011 which found respectively 32.4% of Rotavirus. This difference could be explained by the fact that in our study (retrospective) the requests to search for viruses were related to a presumption of viral infection while in the other two (prospective), the searches were carried out on all stool.

This confirms the major role of Rotaviruses in diarrhea in children under 5 years old. Out of 465 negative stool cultures, 452 patients were on probabilistic antibiotic therapy, ie 97.20%, with the overwhelming majority of the combination ceftriaxone + gentamycin. This frequency is higher than that of ZAGRE at the CHP-CDG, which found 76% of probabilistic antibiotic therapy [11]. This difference in frequency could be explained by our study population of hospitalized patients who received more drug treatment (including antibiotics). This could explain the high frequency (95.88%) of negative stool cultures during the study period. Antibiotic therapy before the sample can decapitate bacterial infections.

Out of 2233 negative stool cultures 159 revealed the presence of parasites, ie 7.12%. Our frequency is lower than that of DEMBELE

at the CHU / Gabriel TOURE (Mali) in 2008 which found 19.7%. This difference could be explained by the techniques of parasite research. In fact, the parasites in our study were found in the fresh state of the stool, while DEMBELE performed more in-depth parasitological examinations of the stool (after concentration, enrichment, coloring). Our low frequency corroborates that of the literature which places parasites in 2nd position, after viruses, among the etiological agents of infectious diarrhea.

Out of 2233 negative stool cultures 68 were screened simultaneously for Rotaviruses and Adenoviruses. 30 were positive for Rotavirus and / or Adenovirus, ie 44.12%. This confirms the major role of Rotaviruses in diarrhea in children under 5, as in TRAORE, which found 61.6% of Rotavirus [12]. This difference could be explained by the fact that his study was prospective, based on an active search for Rotaviruses and Adenoviruses.

NIKIEMA at CHU-YO in 2008 found Campylobacter in 2nd place behind enteropathogenic Escherichia coli with a frequency of 2.33% [13]. This shows that Campylobacter also occupy an important place in bacterial diarrhea. The clinical emergence of Clostridium difficile infection is promoted by the use of antibiotics in asymptomatic carriers. In the context of prescribing high probabilistic antibiotic therapy, the detection of Clostridium difficile is of paramount importance.

Yersinia enterocolitica infection has been reported in all parts of the world but is mostly detected in industrialized countries. The contamination is food and the spread of the infection seems to be linked to the evolution of food packaging and the generalization of cold preservation techniques. The search for Yersinia enterocolitica is essential in our countries because we are witnessing in the big cities the same food packaging and techniques of food preservation by cold. Yersinia enterocolitica can also develop at 4°C (cryophilic germ).

Conclusion

Infectious diarrhea is a public health problem around the world, especially in developing countries. Stool culture is the most requested examination for the laboratory diagnosis of mainly bacterial intestinal infections. During the period of our study, it emerged a prevalence of 4.12% of positive stool cultures A prevalence of 7.17% of parasites and 44.12% of Rotavirus / Adenovirus We noted a probabilistic antibiotic therapy before sampling in 97, 20% of cases. Also, there were no suitable culture media for the isolation of certain germs such as Yersinia enterocolitica, Campylobacter jejuni and Clostridium difficile.

This study made it possible to show the difficulties of the etiological diagnosis of intestinal infections. Hence the need to take into account epidemiological, clinical and technical parameters for carrying out stool cultures in order to optimize laboratory results.

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