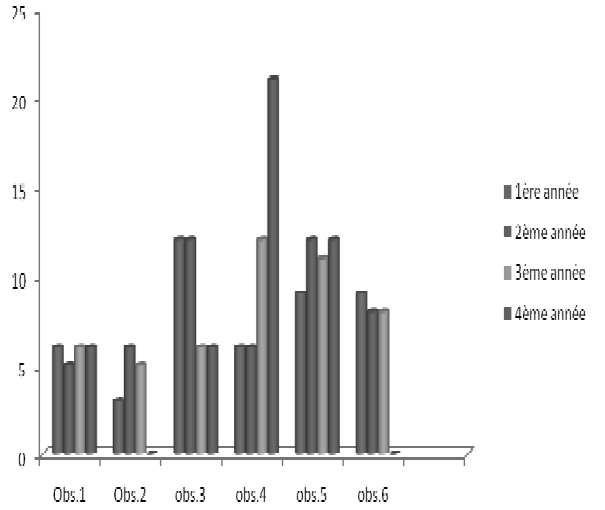
électrolytiques. Le métoclopramide a été indiqué dans quatre cas, la cimétidine dans trois cas et l'oméprazole dans deux cas. Cinq cas sur six ont bénéficié d'un traitement prophylactique à base d'érythromycine à la dose de 20 mg/kg/j pendant une durée de 6 mois avec une bonne tolérance et absence de récidive dans 4 cas après un recul de 5 ans ; un malade est perdu de vue 3 mois après le début du traitement (figure 1). Le 6ème patient n'a pas adhéré à son traitement.

Tableau 1 : Caractéristiques épidémiologiques et évolutives de nos patients

Obs.	Sexe	Age de début (ans)	Complications aiguës	Traitement prophylactique	Evolution
1	F	2	-	Erythromycine X 6 mois	Favorable Recul = 5 ans
2	G	1,3	-	Erythromycine X 3mois	Favorable Recul = 3 mois
3	G	9	DH stade II Hypo Na+ IRF HD	Métoclopramide + famodine X 2 mois	Récidive Perdu de vue
4	G	6	IRF Hyponatrémie Hypokaliémie HD	Erythromycine X 6 mois	Favorable Recul = 5 ans
5	G	6	DH stade I Hyponatrémie Hypokaliémie HD	Erythromycine X 6 mois	Favorable Recul = 5 ans
6	G	7	DH stade II HD	Erythromycine X 6 mois	Favorable Recul = 5 ans

DH : déshydratation
IRF : insuffisance rénale fonctionnelle
HD : hémorragie digestive

Figure 1 : Evolution de la fréquence des épisodes de vomissements sur une période de 4 ans



Conclusion

Le syndrome des vomissements cycliques est une entité clinique rare essentiellement pédiatrique. Il reste mal connu par les cliniciens. Il doit être évoqué devant des vomissements qui évoluent par accès périodiques sans étiologie chirurgicale ou médicale évidente chez un enfant tout à fait asymptomatique entre les accès. Son pronostic est grevé par la survenue dans les formes sévères de complications hydro électrolytiques et les hémorragies digestives. Ces formes sévères sont l'indication d'un traitement prophylactique telle que l'érythromycine qui semble prometteuse.

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Pica, parasites and anemia among women from 15 to 49 years of age in tunisia

Anemia is a world public health issue. 3.5 billions of individuals suffer from iron deficiency and more than half of pregnant women are anaemic. Pica is a behaviour disorder defined as an irrepressible desire to ingest edible or non edible substances. There are different types according to the ingested substance: earth, clay (geophagia), ice or frost (pagophagia), rice (rysophagia), starch, wheat (amylophagia), stones (lithophagia) and others [1-5]. Pica is often found in anaemic iron deficient women [6]. Pica prevalence in Africa and the West Indies is superior to 50% (especially geophagia) [7].
The aim of this study was to assess prevalence of pica or geophagia and the possible link between martial anaemia (iron deficiency), pica, and the etiological parasitic factors in women aged between 15 and 49, and still in the procreation age range.

Patients and methods

The study has been carried out on 379 women aged between 15 and 49. Among these women, 281 live in the Greater Tunis area and 98 are from the South West. Among the latter women, 160 of them come from urban areas and 219 are from rural areas.

- Iron deficiency secondary to malabsorption:
The iron dosage has been determined from serum obtained by total blood centrifugation, sampled in the morning on an empty stomach for the anemic subjects (haemoglobin rate inferior to normal). The dosage of seric iron is determined by the Ferrozine colorimetric method, Synchron Kit and analyser CX7-Beckman [8]. Transferrine dosage in serum has been carried out from serum obtained by total blood centrifugation sampled on an empty stomach for the anemic subjects. The reactive transferrine is used to measure transferrine concentration by the immunoturbidimetric method [9]. Ferritine dosage in serum is obtained by total blood centrifugation on an empty stomach for the anemic subjects. The ferritine dosage is determined by immunoenzymology, Biochem Immunosystems Kit, using an "anti-ferritine" mixed agent of rabbit and mouse [10].

- Iron deficiency related to parasitic infestation:

a) Samplings:
Due to reasons related to the feasibility of the survey, only one parasitical stool examination
has been carried out. Fresh stools have been collected in disposable flat bottom spittoons. The
same spittoons have been used for stools preservation. The stools collected one day before have been accepted only if they are preserved in a cool place. For the South West area, the examination has been done at the same time as the quantitative survey on anaemia and has involved the whole sample. For the Greater Tunis area, the quantitative survey has preceded the parasitical analysis. Only two groups have been examined: the group of anaemic subjects and another group paired with the group of anaemic subjects according to sex, age and strata and selected by systematic draw.

b) Techniques
The analysis consists of two stages:
- A fresh direct examination to make obvious the vegetative shape of the protozoa (namely amoebae and certain flagellate such as giardia) and an examination after clarification or KATO technique [11-13] to identify helminth eggs. This stage has been carried out on the premises for the South of Tunisia area and at the laboratory of Tunis Faculty of Medecine for
The Greater Tunis area:
Equipment: Holding-object slides, rectangular cellophane little slides of 22 x 30 mm. The cellophane used must be soaked and of middle thickness (Quality n° 124 PD Dupont de Nemours or 500PT cellophane).
A stainless steel fine mesh metallic canvas divided into 4 cm squares.
Reactive: Malachite green glycerin solution:
Glycerin 100 ml; distilled water 100 ml; Green malachite (Aqueous solution at 3%) 100ml
Cellophane slides are soaked in this reactive during 24 hours.

c) Preparation of the thick smear:
Sample approximately 50 mg (100 mg maximum) of faeces and place them on a holding object slide. This quantity corresponds to a cube of faeces of approximately 4mm side. If the excreta contain bulky fragments, it is advised to eliminate them by crushing a faeces sample through a metallic canvas: place a nut size amount of faeces on a smooth and hard surface; push on the sieve; collect 50 mg of stools that have come out through the mesh. After use, the sieve is cleaned then sterilized in a flame to avoid parasite introduction in a stool that will subsequently be analyzed. Cover the faecal sample with a cellophane slide soaked with a glycerinated reagent and press on the slide so that the stools cover a surface of approximately 20 to 25 mm on each side. We can, for example, obtain this result by using a rubber stopper or by inverting the slide, with the cellophane placed below the slide and pressing it against a thick filter paper placed on a draining board.

d) Clarification:
Keep the smear at the laboratory temperature for an hour or for 20 to 30 minutes at 34-40°C. These conditions have been determined so that the clarification focuses on the stools and not on the eggs. If these conditions are not respected, an over-clarification would alter the eggs (namely ankylostome) and so would not be observed. The clarification process can be temporarily stopped by inverting the slide, with the smear placed below the slide on a flat surface till examination time or when clarification is resumed.

e) Microscopic examination:
The preparation is then directly examined. An examination of a stool concentrate according to Ritchie's technique. This method gives the ability to make obvious protozoa kysts. It has been carried out at the laboratory of Tunis Faculty of Medecine on stools on which formalin has been applied.
Reactives: Formalin saline solution:
Sodium chlorure 9.0 g; Formalin100 ml; Water 900 ml
Buffured alcoholic solution ph 7: Citric acid 17.6 g; Disodic phosphate 88.0 g; Hot distilled water 4000 ml; Ethylic alcohol at 95° 1050 ml; Triton x 100 12 ml; Ether.
Mix the stool with a formalin saline solution. Pass through a sieve. Centrifuge for 3mn at 2000 rounds/mn. Resume the sediment with the formalin saline solution; centrifuge 3mn at 2000 rounds/mn. Resume the sediment with an alcoholic solution .Emulsify with ether. Centrifuge at 1500 rounds during one minute. Resume the sediment with a small liquid volume; pass through a sieve; leave for sedimentation for 15 mn. Analyze the sediment.

Statistics and analysis:
For frequency comparison, we used Chi square and the exact Fischer tests. A p value of <0.05 was considered as significant. Measurement of the association between the potential risk factors and anemia, used logistic regression model based on the constitutional method.

Results

Pica
According to figure 1, South West women as well as those living in rural areas are more affected by pica, namely geophagy, than those living in the Greater Tunis and urban areas (respectively 40% and 46.5% versus 25.8% and 27.7% for iron deficient women). Figure 1 shows a pica rise in the presence of martial anaemia.

Parasitic etiological anaemia factors:
According to figure 2, anaemic women seem to be as much

affected by parasites as non anaemic women. No significant difference has been observed between the two groups. Intestinal parasitism is more widespread in the South West than in the Greater Tunis area for both groups of women.

Figure 1 : Pica prevalence among anemic women with iron deficiency (DW) and non deficient women (NDW) (%).

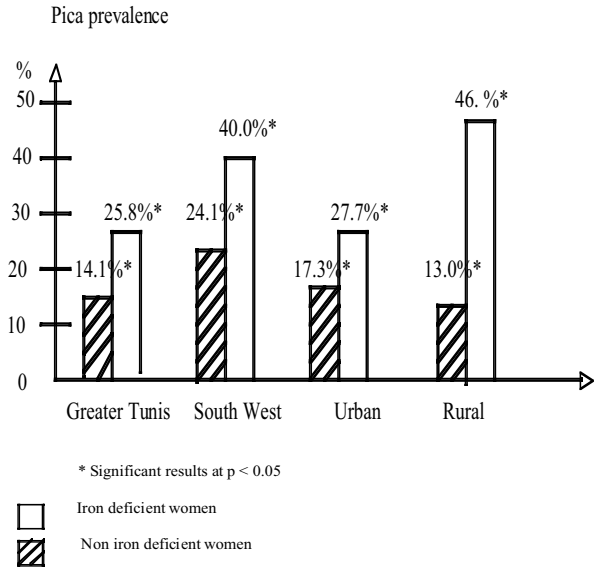
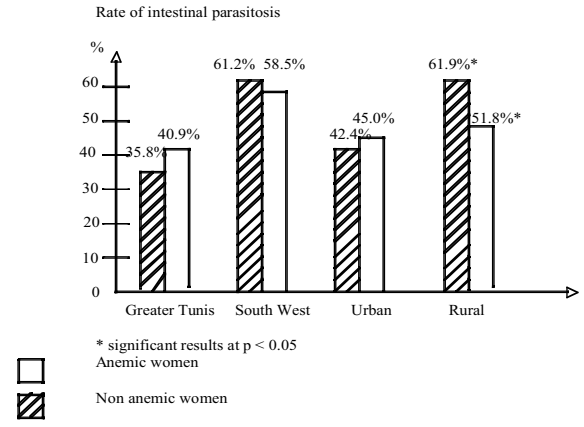


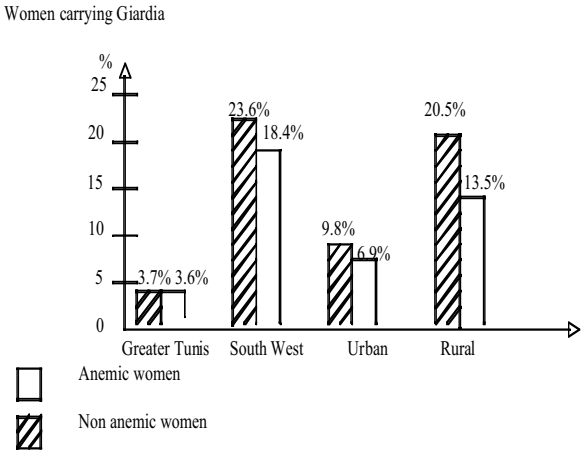
Figure 2 : Rate of intestinal parasitosis among anemic women (AW) and non anemic women(NAW) (%).



Equally, rural women, whether anaemic or not, are the most affected by parasites. In rural areas, however, a significant intergroup difference has been observed: non anaemic women are more affected by parasites than the anaemic ones (61.9% versus 51.8%). The rates of anaemic women carrying Entamoeba histolytica is almost nil in all regions and settings except for the South West where the prevalence rate is 0.6% and in rural areas where the prevalence rate is 1.2% (table 1).

As for Ascaris lumbricoides and ankylostomes, these women present nil rates except for the latter one, the South West region (0.4%) and the urban areas (0.2%). Non anaemic women who carry Entamoeba present a 1.4% rate in rural areas. The results for Ankylostomasis are almost the same as those observed for the anaemia inducing parasites because it seems that non anaemic women are the most affected by this parasite as well as those living in the South West and rural areas (figure 3). Giardia infestation is significantly more important in martial deficiency anaemia women than in non deficient women. Non anaemic women are significantly more affected by Giardia than anaemic women (20.5% versus 13.5%). On the other hand, Giardia is more frequent in the South West for both groups of women whether deficient or not.

Figure 3 : Pica prevalence among anemic women with iron deficiency (DW) and non deficient women (NDW) (%).



Conclusion

In our study, pica affects women in the procreation age range in the South West as well as those living in rural areas more than women living in urban areas of the Greater Tunis area. Pica affects namely iron deficient women and can be a cause of sideropenic anaemia. Intestinal parasitism is more widespread in the South West than in the Greater Tunis area, whether the women are iron deficient or not. Anaemic women who are still in the procreation age range, seem to be as much affected by parasites as non anaemic women. Rural women are more affected by parasites than urban women, whether anaemic or not. In rural areas, this parasitism affects 61.9% of non anaemic women. Entemoeba histolytica, Ascaris lumbricoides and ankylostomes have been found in women still in the procreation age range, whether anaemic or not. Thus, we notice that in rural areas, non anaemic women infestation by anaemia inducing parasites is more important than the one found in anaemic women. In both groups of women, the infestation rate by these parasites is higher in the South West than in the Greater Tunis area; in addition to this, rural women seem to be more affected.

Table 1 : Rate of anemic women and non anemic women who carry Entamoeba histolytica, Ascaris lumbricoïdes and Ankylostomes (%).

	Number of subjects	Entamoeba histolytica	Ascaris lumb-ricoïdes	Ankylostomes	Number of Subjects	Entamoeba histolytica	Ascaris lumbricoïdes	Ankylostomes
Greater Tunis	281	0	0	0	225	0	0	0
South west	98	0.6	0	0.4	488	0.9	0.9	0

Ascaris is absent in the Greater Tunis area, the South West and urban and rural areas in the case of anaemic women. Basically, the contamination by the three parasites Entamoeba histolytica, Ascaris lumbricoides and Ankylostomes is low in anaemic and non anaemic women. We have particularly focused on Giardia intestinalis as an anaemia inducing parasite, much more than on the other parasites and it has turned out that Giardia affects non anaemic women more than the anaemic ones.

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