

Human Head Lice Infestation In Nigeria: Observations and Review of Relevant Literature

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ABSTRACT:

There is an observed increase in the numbers of patients presenting to hair stylists and dermatologists with human head lice. Infrequent hair washing, sharing of combs within the home and at the hair salon is known to contribute to transmission of this ectoparasite. It has been noticed that a significant number of those affected have natural untreated hair suggesting that chemical straighteners used in the past may have reduced the presence of head lice. Apart from the discomfort and stigmatization associated with head lice it had also been associated with some re-emerging infections emphasizing the need for awareness on this rising trend. A high index of suspicion together with appropriate diagnostic acumen is necessary to identify human head lice infestation especially in the natural black African hair with its peculiarities. We have observed that many patients have resorted to using chemical hair straighteners in an attempt to treat and prevent head lice infestation due to anecdotal reports and general belief of the population of its effectiveness. There is a need for proper treatment of this condition so as to prevent the unwanted side effects of these chemicals.

INTRODUCTION

Human head lice infestation is highly contagious and transmitted usually from direct physical contact with an individual with lice infestation or contact with infested personal items including hair grooming gadgets, head gears and beddings¹. It is usually found in school children, especially females². In addition to the nuisance associated with the itch caused by an allergic reaction to the saliva of the lice during blood meals and the social stigma, human lice is known to transmit rickettsial organisms which cause epidemic typhus and scrub typhus and *Borrelia recurrentis* which causes relapsing fever and secondary bacterial infections especially impetigo. These are transmitted by scratching and rubbing the louse faeces or body into the skin. Scalp pyoderma is a complication of head lice as the lice bears *S. aureus* and *Strept. pyogenes*.³

An increasing number of African women are beginning to wear their natural hair texture.⁴ They have stopped the use of chemical hair relaxers which eliminate the tight curls therefore making it easier to manage⁵. The chemical hair relaxers are emulsions of sodium, potassium, lithium, and

guanine hydroxide which are caustic⁵. They exert their actions by disrupting the cysteine disulfide bonds of the hair, structurally damaging the hair shaft, decreasing its tensile strength compared to untreated hair while straightening the hair⁶.

The numerous benefits of the natural hair styling methods are well known. However, the natural hair in the dry and wet state is more difficult to comb than the relaxed hair⁷ due to its tight curls⁸ and is therefore difficult to style and manage. This may result in infrequent washing and combing of the hair, it is believed that the natural hair reduces the risk of traction alopecia, hair breakage and unwanted side effects of hair relaxers which includes endocrine abnormalities in women⁹. We have observed an increase in the number of individuals with natural hair styles presenting with head lice in our locality when compared with those with chemically treated hair. This is worrisome as this reemergence of head lice especially in populations that practice natural hair styling may lead to the reemergence of infectious diseases like typhus and scrub fever. Regardless of the anecdotal belief that these chemicals in hair are capable of killing adult lice and possibly destroy nits backed up with few studies that validate these claims¹⁰, it is



not a conventional treatment modality. This is because they are harsh and can cause considerable side effects and ideally should not be used in children.

The aim of this article is to review the available data on head lice.

METHODOLOGY

We conducted a PUBMED search for relevant articles on head lice written in English. We also included information gotten from oral communications and anecdotal experiences.

Preamble

The human head louse (*Pediculus capitis*) is ubiquitous in nature. Its infestation of humans has been in existence since ancient times. The human head lice are believed to have evolved from head lice on chimpanzees over 5.5 million years ago¹¹. The earliest evidence of its existence dates back to 3000 B.C where nits were uncovered in 3000 BC in the hair of a 10,000-year-old buried mummy at an archaeological site North east Brazil mummified bodies¹² and have been discovered to have infested humans as far back as thousands of years ago. Although it was initially thought to be the disease of the poor and homeless and thus associated with socioeconomic status, recent reports suggest that it can be found in virtually every socioeconomic class¹. Interactions between individuals of different socioeconomic levels involving sharing of hair care items like in hair salons, schools etc. and subsequently among household contacts are probable avenues for transmission in these settings.

PREVALENCE

There are no documented racial or ethnic predilections to lice infestation. Its prevalence varies depending on several factors including the study design (community based or hospital-based studies), diagnostic method used and geographic location of the study participants (westernized or developing nations) and ranges from 0.7%-70%¹³⁻¹⁶. Most Nigerian studies reported a prevalence ranging from <1% to 45.6%¹⁷⁻²². One large study conducted in River State in 2011 found a high prevalence of 45.6% among 726 primary school

children, with a predilection for the girls, using the visual inspection method. Most of these studies are predominantly limited to the paediatric population especially school children, none included the adult population.

Higher frequencies of head lice infestation are seen among girls and women. The belief that the natural hair has a greater propensity to promote head lice infestation is held in most parts of Nigeria. The infrequent washing of the natural hair due to difficulties with combing and keeping natural hair styles for longer periods are thought to be contributory.

It is believed that with improved diagnostic techniques including the use of dermoscopy, studies exploring the current prevalence with increased diagnostic precision in different hair textures will be enlightening/illuminating.

TRANSMISSION

Far from being a measure of personal hygiene, the major means of transmission of head lice is through direct human contact. Although, the contribution of the other means of transmission other than head to head contact such as sharing of infested personal items such as combs, brushes, headgears, pillow cases, towels, blankets, hair adornments, head phones etc., is contentious²³⁻²⁶, transmission through shared objects i.e. hair combs especially in the hair salons are possible. However, some authors believe that the ease of transmission with these are much less common than head to head contact with an individual with head lice²⁷. Further reports are needed to investigate the role of shared objects especially hair combs from hair salons to understand the role of non-head to head transmission in Nigeria.

One study found that the size of a household (≥ 6 inhabitants) was significantly associated with the prevalence of head lice infestation²⁸. Interestingly, the ease of transmission with respect to spread of the nits from broken hairs as a result of increased hair shedding from the increased fragility associated with the processed hair²⁹ makes the chemically processed hair more likely to increase the risk of transmission, a presumption that needs

to be further explored. In the authors' opinion, it will be of interest to compare the risk of transmission in these two groups.

DIAGNOSIS OF HUMAN LICE

Head lice are usually found around the ears, the temple and on the hairline above the nape of the neck³⁰. Diagnosis is usually clinical either through systematic visual inspection or detection combing³¹. The presence of nymphs, adults and/or viable ova or nits firmly attached within a quarter inch of the base of the hair shaft is an indicator of active infestation while identification of empty nits and dead ova particularly when they are attached more than a quarter inch (>6.5mm) of the base of the hair shaft are non-viable and if no active nymph or adult lice are seen is an indicator of previous infestation³².

Self-diagnosis of head lice infestation by visual inspection is the commonest method of the lice detection as it has been found to be simple to perform, fast and costs almost nothing. One study conducted in Nigeria found it to be reliable method with a higher sensitivity (73.6%), specificity (99.1%), positive predictive value (97.2%) and negative predictive value (90.2%) than wet combing³³. Although supported by some other studies^{34,35}, this finding is at variance finding low sensitivity of visual inspection even when all the hair are inspected^{36,37} especially if there are few eggs and nits. One study found that debris like dandruff and epidermal scales and other arthropods (bed bugs, beetles) contributed to false positive diagnosis of head lice based on visual inspection³⁸.

Detection combing can be performed on dry or wet hair. In wet combing, the head is moistened with water and a lubricant such as hair conditioner applied to it. Subsequently, a fine toothed "Nit or louse Comb" which are designed to have parallel sided teeth 0.2 mm between them, to ascertain that even the small first instar nymphs are caught between the teeth^{31, 36, 39} are inserted near the crown until it touches the scalp, then it is drawn firmly down and observed for the presence of lice after each stroke

Detection combing is more time-consuming and

more expensive than visual inspection. Wet combing has been shown to be more effective than dry combing. This is because systematic combing is easier as wet and conditioned hair is easier to disentangle, making it easier to comb out. It is also believed that conditioner makes the hair sticky, promotes lice immobility and makes the head lice unable to "escape. The conditioner is then wiped off the comb on sanitary paper to detect lice stuck between the teeth of the comb³¹.

Wood's lamp causes nits to fluoresce a pale blue and can serve as a useful tool for distinguishing head lice from hair casts, seborrheic scales and hair spray or dirt particles.

Another diagnostic method, the vacuuming method, which involves scalp inspection using a vacuuming apparatus made up of a regular vacuum cleaner adapted with a commercial *voile* used as a filter, inserted between the hose and the flat nozzle, to capture small particles and head lice. The vacuuming method is performed by applying the vacuum all over the head of each participant for 2 to 3 min according to the hair length, mostly on the neck and behind the ears. The filter is then removed and transferred to a 47 mm *Petri* dish and analysed with a stereomicroscope under 20-40 x magnifications. This method was reported to have 2.74 to 7.87 times most likely to detect active infestation able to detect active infestation by one study⁴⁰. This method will be impracticable in resource limited practice settings like ours.

Although there are few documented reports on the role of dermoscopy as an aid in the diagnosis of head lice infestation⁴¹, there are currently no studies comparing the sensitivity/specificity of diagnosis when compared with other methods. However, an author explored the usefulness of dermoscopy in the diagnosis of pubic lice infestation due to its smaller body⁴².

The detection of nits and lice has been found to be easier in shorter hair⁴². The greater hair density afforded and the tendency to tangle easily by the natural hair when compared with the relaxed hair may make it more difficult to identify the nit and lice. However, studies comparing the ease of identification of nits and lice in natural and

chemically processed hair with respect to the varied hair density are lacking. Finally, the knots commonly seen in the tightly curled natural African hair may confound diagnosis due to high false positives.

TREATMENT OF HEAD LICE IN THE CHEMICAL NON-PROCESSED (NATURAL) HAIR

Historically, several methods of treatment of head lice included: hand picking of the lice followed by crushing of the lice with the fingers, shaving of the hair^{43, 44}. Surprisingly, in spite of the high prevalence of the injudicious use of local herbs in the treatment of dermatological conditions there was no report found on the use of local herbs in the treatment of head lice in our environment.

However, information gathered from oral communications and personal observations by the authors' show that locals believe that non-conventional therapies like use of kerosene mixed with camphor, engine oil and chemical hair relaxers¹⁰ are more effective in eliminating head lice than the conventional topical agents like permethrin. Shaving of the head although very effective and a popular method employed especially in the rural parts of Nigeria and especially in children is considered cosmetically unacceptable.

Current treatment modalities for head lice infestation include mechanical methods directed at manually extracting the lice and the nits using specially designed combs or the hands and use of chemicals directed at either killing the lice by suffocating it, causing water dysregulation or through neurotoxic effects on the lice. Live lice on surfaces and objects can be killed with hot water or putting the objects in air tight plastic bags and left there for 2 weeks.

Topical pediculicides are the recommended first line agents. Manual removal is considered an alternative where pediculicides are contraindicated, while oral therapy is employed for treatment failures or refractory conditions. The topical pediculicides include pyrethroids, malathion, benzyl alcohol, spinosad and topical ivermectin. Choice of therapy will depend on cost,

resistance patterns, choice and age among others. While permethrin and the pyrethroids are preferred because they are inexpensive and well tolerated with very low toxicity potential, resistance to permethrin and malathion have been documented⁴⁵⁻⁴⁸. Some authors believe that the majority of drug resistance may be due to poor adherence to treatment and reinfestation. Spinosad and topical ivermectin on the other hand are expensive. Oral ivermectin is well tolerated and effective but is contraindicated in pregnancy and in individuals less than 15kg body weight. Topical permethrin and oral ivermectin are readily available in Nigeria and can be gotten as over the counter medications.

Wet combing is time consuming and cumbersome. The ease of combing and removal of nits as well as the number of sessions required in the natural hair (whether wet or dry) when compared with the relaxed hair is not known. However, the finding that the detection and removal of head lice is much easier in shorter hair⁷ conveys a contradiction to this as the natural hair is usually shorter than the relaxed hair. Nonetheless, cutting the hair has not been found to improve the removal of nits and crawling lice.

Other alternative treatments with reported anecdotal success include hair relaxers¹⁰, Kerosene¹⁰, tea tree oil⁴⁹ and neem oil⁵⁰, petroleum jelly¹⁰, mayonnaise¹⁰, olive oil⁵¹. Others include cresol, naphthalene, sulfur, mercury, naphthalene, and petrolatum alone or in combination with vinegar or oil^{44, 52}, oral cotrimoxazole⁵³, hair dryers¹⁰, hot air⁵⁴, hot curling irons¹⁰. Some of these options are not recommended due to the caustic nature and flammability of the substances. Furthermore, the efficacy of these modalities have not been ascertained. A comparative efficacy study conducted in Iran found that of 1% permethrin, 0.2% parasidose (d-phenothrin) or 4% dimeticone lotion preparations, Dimeticone lotion had the fullest efficacy (100%) among all treatments⁵⁵.

Close contacts should be treated to prevent re-infestation.

Local therapies for the treatment of head lice in Nigeria are yet to be explored. Additionally, there

are currently no available data from Africa comparing various treatment modalities including the local therapies to determine their efficacy, safety and acceptability . This will facilitate synchronization of treatment modalities and expedite the determination of patterns of resistance of conventional and local pediculicides.

CONCLUSION

Human head lice has a potential for spread irrespective of socioeconomic status and age. This is because its primary mode of spread is by head to head contact. An observed growing trend of its spread from hair styling gadgets from hair salon as the possible predominant mode of spread implies that this constitutes a public health threat. Doctors especially dermatologists and other health care professionals require a high index of suspicion in people that present with itching on the scalp in order to reduce the risk of outbreaks just like scabies. In our environment, sharing combs in

public places like hair salons, patients should be advised to bring their comb along while visiting hair salons, potential to spread to adults.

FUTURE INSIGHTS AND DIRECTIVES

No studies have been done to compare the prevalence of lice infestation in people with natural hair and chemical processed hair. The link between lice infestation and some re-emerging diseases demands that a search for serologic evidence of bacterial and rickettsial and borrelial antigens in individuals with head lice be done. With increasing number of adult females wearing natural hair styles, community-based studies involving adults rather than those limited to the paediatric population should be conducted. The big question as to if the natural hair texture, gives the nits a better grip or the increasing incidence related to use of chemical hair relaxers is a question that needs to be resolved.



Figure 1



Figure 3: Live lice dislodged from the scalp of the above patient

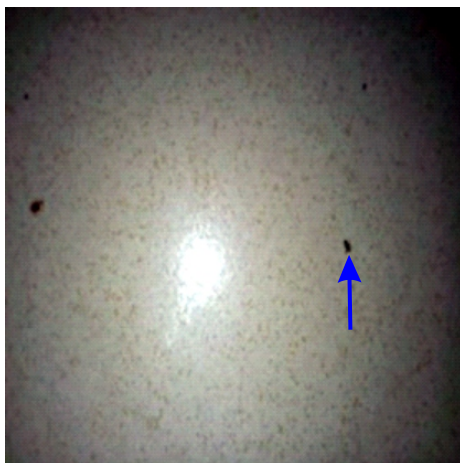


Figure 2: Five year old Nigerian girl with live lice on her scalp



Figure 4: Close up pictures of live lice on a patient's scalp

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