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PREVALENCE AND RISK FACTORS OF ALOPECIA AREATA AMONG GENERAL POPULATION: SYSTEMATIC REVIEW

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Abstract:

Background: *Alopecia areata is a common, clinically heterogeneous, autoimmune and non-scarring hair loss disorder. This disease is not contagious and most often occurs in otherwise healthy people and it affects all age groups, though it is more common in children and adolescent. Some studies were done in this area in families with two or more affected members and reported a strong evidence of genetic association with increased risk for alopecia areata.*

Objectives: *This study aimed to review the prevalence and risk factors of alopecia areata among the general population in previously conducted studies covering these points.*

Methods: *PubMed database and EBSCO Information Services were used for articles Screening. All related papers with the subjects to study regarding prevalence and risk factors of alopecia areata, and other articles have been used. We excluded additional papers that are not relevant to this topic. The data was collected as per the particular manner in which the group members would study it.*

Conclusion: *AA is the most prevalent autoimmune disorder and the second most prevalent hair loss disorder after androgenetic alopecia, and the lifetime risk in the global population is approximately 2%. Genetic factor is strong in AA, but environmental factors such as infection and psychological stress may still play an important role. AA is associated with psychiatric and medical comorbidities including depression, anxiety, and several autoimmune disorders, and an increased global burden of disease.*

Keywords: *alopecia, alopecia areata, hair loss, trichoscopy, treatments, pathogenesis, and epidemiology.*

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INTRODUCTION:

Alopecia areata is a common, clinically heterogeneous, autoimmune and non-scarring hair loss disorder [1, 2]. Inflammatory cells target and attack the hair follicle, thus causing hair loss and the hair falls out in round patches. The hair can fall out on the scalp and elsewhere on the body. This disease is not contagious and most often occurs in otherwise healthy people and it affects all age groups, though it is more common in children and adolescent. A few cases of congenital alopecia areata have been reported [3]. It occurs more frequently in people with a positive family history of the disease who have affected family members, suggesting heredity may be a factor [4]. Some studies were done in this area in families with two or more affected members and reported a strong evidence of genetic association with increased risk for alopecia areata.

Diagnosis of alopecia areata is usually based on clinical features and trichoscopy may aid in establishing the diagnosis. Typically, the first symptoms of alopecia areata are small bald patches. The underlying skin is unscarred and looks superficially normal. Although these patches can take many shapes, they are usually round or oval [5]. This patchy hair loss may regrow spontaneously or may need a long course of treatment. The hair loss area may tingle or be painful and the hair tends to fall out over a short period of time [6]. The most common site of alopecia areata attack is on one side of the scalp than the other [7]. In other cases, there can be extensive patchy hair loss and in rare cases there is loss of all scalp and body hair. Unfortunately, this loss of hair, especially from scalp can cause psychological distress affecting quality of life, so psychosocial support and therapy is also an important part of disease management.

Treatment of alopecia areata has posed a challenge to physicians and has limited success, especially in resource-poor settings, no cure has been found, and no therapy has been able to prevent disease relapse [1, 3, 4].

Treatment options ranges from the use of wigs, topical medications, and hair transplantation, topical immunotherapy, topical minoxidil, topical irritants, and systemic immune-suppressants [7, 8]. The cost of treatment is considered high. Despite this high cost, treatment is still associated with side effects and involves several sessions which may last for more than 12 months and hair loss may reoccur when treatment is stopped.

Objective:

This study aimed to review the prevalence and risk factors of alopecia areata among the general population in previously conducted studies covering these points.

METHODS AND MATERIALS:

PubMed and EBSCO Information Services were chosen as the search databases for the publications used within the study, as they are high-quality sources. PubMed being one of the largest digital libraries on the internet developed by the National Center for Biotechnology Information (NCBI) which is a part of the United States National Library of Medicine. Topics concerning prevalence and risk factors of alopecia areata, and other articles have been used in the making of the article. Restriction to the last 20 years and English language due to unavailable resources for translation was used. The founded articles were screened by titles, and reviewing the abstracts yielded 11 articles which were enrolled. Inclusion criteria: the articles were selected based on the relevance to the project which should include one of the following topics; 'alopecia areata, epidemiology of alopecia areata, risk factors of alopecia areata. Criteria for exclusion: all other publications which did not have either of these subjects as their main end, or repetitive research, and analyses of reviews were omitted.

Statistical Analysis:

No software has been utilized to analyze the data. The data was extracted based on specific form that contains (Author's name, publication year, country, study type, and results). These data were reviewed by the group members to determine the initial findings, and the modalities of performing the surgical procedure. Double revision of each member's outcomes was applied to ensure the validity and minimize the mistakes.

RESULTS:

After applying the inclusion and exclusion criteria, the 32 identified papers were further reduced to 22 papers for full-text assessment and only 11 papers were included. The included studies had different study designs and population types.

Table (1): Author(s), year of publication, study design, study setting and conclusion of included studies

Publication (Author, Year)	Type of study	Study objective	Conclusion	Ref
Hye Rin You. Et al., 2017 Aug 25	Hospital based, cross sectional study.	To investigate the differences in clinical profiles according to disease severity and to determine risk factors for severe alopecia areata.	This is the largest case analysis in Korean patients with alopecia areata. Clinical profiles stratified by disease severity warrant further study.	9
Alexandra Cristina Villasante Fricke. Et al., 24 July 2015	Systematic review	to provide an evidence-based systematic review on the epidemiology and the burden of AA	AA is the most prevalent autoimmune disorder and the second most prevalent hair loss disorder after androgenetic alopecia, and the lifetime risk in the global population is approximately 2%. AA is associated with psychiatric and medical comorbidities including depres-sion, anxiety, and several autoimmune disorders, and an increased global burden of disease. AA is the most prevalent autoimmune disorder and the second most prevalent hair loss disorder after androgenetic alopecia, and the lifetime risk in the global population is approximately 2%. AA is associated with psychiatric and medical comorbidities including depres-sion, anxiety, and several autoimmune disorders, and an increased global burden of disease.	10
Arti Nanda M.D., et al. 23 November 2002	prospective survey	to determine their clinical and epidemiologic features of AA	Inguinal hernia is a significant public health problem in Tanzania. If Tanzania continues to address inguinal hernia at its current surgical repair rate, a backlog of nearly 1 million cases for repair will develop over the next 10 years A majority of the patients (80.5%) had mild disease and extensive disease (more than 50% hair loss) was seen in 13% of the children. A positive family history of AA was obtained in 51.6% of cases and nail changes were seen in 26.5% of the children. The age of onset, a positive family history of AA, and associated atopic disorders were observed to have no influence on the extent and severity of the disease. The results were compared with those reported elsewhere for this age group.	11 11 11
Benigno, Michael et al. 1 Apr. 2020,	Cross-Sectional Survey Study	To define the current AA point prevalence estimate among the general population in the US overall and by severity.	This study suggests that the current AA prevalence in the US is similar to the upper estimates from the 1970s at approximately 0.21% (700,000 persons) with the current prevalence of "moderate to severe" disease at approximately 0.09% (300,000 persons). Given this prevalence and the substantial impact of AA on quality of life, the burden of AA within the US is considerable.	12

Lee HH, Gwillim E, Patel KR, et al.	A systematic review	To determine the prevalence, incidence, and predictors of AA, alopecia totalis, alopecia ophiasis, and alopecia universals.	AA affects 2% of the global population. AA prevalence is lower in adults than children, is increasing over time, and significantly differs by region.	13
Villasante Fricke, A. C., & Miteva, M. (2015).	Systmatic Review	The objective of this study is to provide an evidence-based systematic review on the epidemiology and the burden of AA.	The lifetime incidence of AA is approximately 2% worldwide. Both formal population studies found no sex predominance. First onset is most common in the third and fourth decades of life but may occur at any age. An earlier age of first onset corresponds with an increased lifetime risk of extensive disease. Global DALYs for AA were calculated at 1,332,800 in 2010. AA patients are at risk for depression and anxiety, atopy, vitiligo, thyroid disease, and other autoimmune conditions.	14
A. J. G. McDonagh , et al., 20 August 2002	Review article	-	There is now a considerable array of evidence for alopecia areata as a polygenic autoimmune disease. Further research on genetic and functional aspects is needed to pinpoint the MHC genes involved and to elucidate the role of IL-1 cluster genes and chromosome 21 genes in the pathogenesis. These studies should be performed in patient groups with well-defined and documented clinical subtypes of alopecia areata to facilitate correlation of the clinical and genetic findings.	15
Aysha A. Alshahrani,et al., 13 Mar 2020	retrospective cross-sectional study	To describe the prevalence and clinical characteristics of Saudi patients with AA.	A total of 216 patients with AA were included. The overall prevalence of AA was approximately 2.3%. The mean disease duration at the time of presentation was 2 months while the mean age of onset was 25.61 years. The most common type of AA in both adult and pediatric groups was the patchy type involving the scalp. Comorbid diseases were found in 32.41% of patients. Common associated conditions included hypothyroidism, diabetes mellitus, and atopic diseases.	16
Mirzoyev, S. A., Schrum, A. G., Davis, M., & Torgerson, R. R. (2014).	population-based analyses	To continue the previous analysis and document the most current lifetime incidence risk of AA.	the age- and sex-adjusted incidence of AA was 20.9 per 100,000 person-years (95% CI, 19.1–22.6). Cumulative AA incidence increased almost linearly with age (0.3%, 20 years; 0.6%, 30 years; 0.8%, 40 years; 1.1%, 50 years; 1.4%, 60 years), while cumulative lifetime incidence was 2.1%. Age-adjusted incidence was 21.3 per 100,000 person-years (95% CI, 18.8–23.9) for females and 20.2 per 100,000 person-years (95% CI, 17.7–22.6) for males (no significant difference, P = 0.77), supporting the observation that both females and males display similar susceptibility to AA.	17

Yang, S., Yang, J., Liu, J. B., Wang, H. Y., Yang, Q., Gao, M., Liang, Y. H., Lin, G. S., Lin, D., Hu, X. L., Fan, L., & Zhang, X. J. (2004).	Cross-sectional study	To describe the genetic epidemiological features of AA patients in China and to determine the possible genetic model for AA.	The effect of genetic factors is strong in AA, but environmental factors such as infection and psychological stress may still play an important role. Our findings on the genetics of AA are consistent with a polygenic additive mode of inheritance.	18
Avital, Y. S., Morvay, M., Gaaland, M., & Kemény, L. (2015).	A population-based cross-sectional study	To use photographs and data from the Internet to evaluate severe AGA and generate greater understanding of the international epidemiology of the disorder in young Caucasian men.	The overall success rate for identifying severe AGA by indirect evaluation of Internet photographs was 94%. The prevalence of severe AGA was 15.33% overall and varied significantly by geographical region. The risk of having severe AGA was increased by 1.092 for every year of age between 30 and 40 years. Severe AGA was more prevalent in subjects with higher body mass index.	19

DISCUSSION:

The epidemiology is variable depending on the cause of alopecia and the type. In alopecia areata, the prevalence is 0.2% with no racial or sexual predilection, and it may affect any age group [20]. Population studies from the Rochester Epidemiology Project estimate a lifetime incidence of AA of 2.1%, in a population in Olmsted County, Minnesota, with no difference in incidence between genders [21]. Some studies indicate a slight female-to-male gender bias, but this may be due to higher female concern regarding hair loss and subsequent treatment [22]. Some studies show that the prevalence seems to shift to women in patients >45 years of age One study found that men were more likely to be diagnosed at an earlier age than women [23]. Although some studies have reported AA to be slightly more common in females [24, 25] such findings might be attributable to a greater cultural awareness of and sensitivity to hair loss among females that prompts them to seek medical attention. Interestingly, in Turkey, a higher male: female ratio (1.6:1) was reported for patients with AA [26]. The authors explained the likely artificial skew toward male patients in the context of religious practices and suggested that the headscarves worn by women may have allowed some to avoid seeking medical attention for hair loss.

Alopecia areata incidence appears to increase almost linearly with age, but the mean age of onset appears to be between 25 and 36 years [27]. Early onset AA (between 5 to 10 years-old) predominantly presents as a more severe subtype [28]. Data shows no demonstrable sex predilection [29]. A systemic review of the epidemiology of AA indicated a similar worldwide lifetime incidence of around 2% [30]. The follow-up study of this population form 1990–2009 found that the cumulative incidence increased almost linearly with age and that the lifetime incidence of alopecia areata was 2.1% [31].

Studies aimed at elucidating the complex genetics of alopecia areata have been undertaken by a number of groups using techniques ranging from candidate-gene association studies to transcriptional profiling of affected skin to large GWAS. The initial genetic studies concentrated on single genes that were known to be involved in related autoimmune diseases. Interestingly, many of these genes did in fact play a role in alopecia areata [32, 33]. Observational studies show a high correlation (10%–42%) between AA and family history [34, 35]. Genome-wide association studies have identified numerous single-nucleotide polymorphisms (SNPs) associated with AA. In a recent meta-analysis, human leukocyte antigen-DR (HLA-DR) on chromosome 6 appears to be the largest risk factor for AA [36].

Environmental factors likely exacerbate or induce AA. Stress is an often-cited cause of AA, but the literature from human studies is inconclusive. Other potential environmental stressors that may be implicated in AA include infections, vaccinations, hormone fluctuations, and diet, although their exact impact is unknown [37, 38]. AA carries associations with an increased overall risk of other autoimmune diseases (16%), including lupus erythematosus, vitiligo, and autoimmune thyroid disease. Additionally, an association with atopic dermatitis exists in 39% of cases [39]. Severe alopecia areata might be accompanied by nail changes. Atopic diseases, such as sinusitis, asthma, rhinitis, and especially atopic dermatitis, are also more common than expected in populations with alopecia areata [40], and are associated with early-onset and more severe forms of hair loss. In a

Korean population, atopic dermatitis was significantly more common in patients with early-onset alopecia areata, whereas thyroid disease was the most common in late-onset disease [41]; findings were similar in Sri Lanka [42].

CONCLUSION:

AA is the most prevalent autoimmune disorder and the second most prevalent hair loss disorder after androgenetic alopecia, and the lifetime risk in the global population is approximately 2%. Genetic factor is strong in AA, but environmental factors such as infection and psychological stress may still play an important role. AA is associated with psychiatric and medical comorbidities including depression, anxiety, and several autoimmune disorders, and an increased global burden of disease.

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