

Clear anterior rhinorrhea in the population

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Background: Clear anterior rhinorrhea is commonly observed in older adults and is widely known as “senile rhinorrhea.” Although appreciated in the literature, no studies support that clear rhinorrhea increases with age. Our goal was to determine the prevalence of clear rhinorrhea in adults and the variation between young and old. Additionally, we sought to determine if clear rhinorrhea was bothersome enough for patients to seek treatment.

Methods: A questionnaire was randomly distributed to 158 adults, 76 young adults on the University of Pittsburgh Undergraduate campus, and 82 older adults at Longwood Retirement Community in 2011.

Results: Older subjects reported more drip and an increase in rhinorrhea over time regardless of gender ($p < 0.05$). Participants wanting to seek treatment reported drip occurred more often, that they used more tissues, and were more

bothered by drip compared to those not wanting treatment ($p < 0.05$).

Conclusion: Clear, anterior rhinorrhea affects older adults regardless of gender significantly more often and more severely than young adults ($p < 0.05$). The more frequent and bothersome the nasal drip, the more likely individuals would elect treatment. © 2015 ARS-AAOA, LLC.

Key Words:

rhinitis; allergic rhinitis; mucociliary clearance; quality of life; chronic rhinosinusitis

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Rhinitis of the older adult, formerly known as “senile rhinorrhea,” is a clinically recognized entity that has not been systematically studied to verify that rhinorrhea increases with age. Several papers describe changes to the nasal cavity during the aging process or management of rhinitis of the elderly.¹⁻⁴ However, none specifically address the prevalence of this disorder, or show that older age rhinorrhea is more prevalent than rhinorrhea at a younger age. Our validated survey of rhinorrhea was administered to a young adult population and an older adult population

(Fig. 1). The survey addressed amount, frequency, tissues used, degree of impairment, and whether the subject desired therapy for the rhinorrhea.

Subjects and methods

This study was done at the University of Pittsburgh Medical Center. The Institutional Review Board of the University of Pittsburgh approved this project. A 13-item questionnaire was developed and was administered at random to 76 students at the University of Pittsburgh undergraduate campus. In addition, the survey was administered to 82 individuals at Longwood at Oakmont, a retirement community outside of Pittsburgh. All analyses were run using SPSS version 19.0 (IBM Corp., Armonk, NY). A 0.05 level of significance was used for all tests. Frequencies, percentages, means, and standard deviations were computed to summarize the demographic characteristics of participants. Chi square tests were used to evaluate associations between categorical variables. Mann-Whitney *U* tests were used to compare symptom severity ratings of participants who would seek medical or surgical treatment to the ratings of participants who would not seek treatment.

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Nose Drip Survey

Investigators: Dr. BJ Ferguson, Dr. Kenneth Rodriguez

We are studying the frequency of watery nasal drip from the front of the nose. Your response to these questions is entirely anonymous and confidential. Thank you for participating.

1. What is your age? _____2. What is your sex? Male Female3. Do you have watery drip from the front of your nose once a week or more not associated with being sick?

a. Yes b. No c. Sometimes

If you answered **no** to question 3 you have completed the survey. If you answered **yes** or **sometimes** please complete the remainder of the survey

4. How often does your nose drip?

a. Once a week
b. 2-3 times per week
c. 4-5 times per week
d. Daily
e. Multiple times each day

5. How long have you had watery drip from the front of your nose?

a. 6 months or less
b. 7-11 months
c. 1-5 years
d. 6-10 years
e. More than 10 years

6. Has your watery nasal drip become more frequent or greater in amount since the time it began?

a. Yes b. No c. Not sure

7. On average how many tissues per day do you use for your watery nasal drip?

a. One per day
b. 2-3 per day
c. 6-10 per day
d. More than 10 per day

8. Have you noticed that your nasal drip occurs during any of the following times?

(May select multiple answers)

a. With meals
b. In the morning
c. At night / while sleeping
d. With certain locations
e. With season change
f. At no particular time

Specify if not above: _____

9. How much does your watery nasal discharge bother you?

a. Not at all
b. Slightly bothersome but it does not interfere with activities
c. Moderately bothersome and interferes but does not prevent certain activities
d. Severely bothersome and prevents me from doing certain activities

10. Would you seek treatment to correct watery nasal discharge?

a. Yes, medical therapy (ex. Pills)
b. Yes, surgical therapy (ex. Laser)
c. Yes, medical and/or surgical
d. No

11. Have you ever been tested for allergies?

a. Yes b. No c. Not sure

12. Do you have allergies?

a. Yes, I have seasonal allergies
b. Yes, I have year round allergies
c. Yes, seasonal and year round
d. No
e. Not sure

13. Do you currently smoke?

a. Yes, I currently smoke
b. No, but I am exposed to smoke
c. No, but I am a former smoker
d. No, I have never smoked

FIGURE 1. Nose Drip Survey as distributed to the studied population.

Results

A total of 158 individuals filled out the survey, 76 in the younger cohort and 82 in the older cohort. Of the 76 younger adults, 25 (33%) reported nasal drip, 8 female and 17 male. Of the 82 older adults, 61 (74%) reported nasal drip, 40 female, 20 male, and 1 nonresponder regarding sexual designation. A total of 86 individuals endorsed clear anterior nasal drainage. The average age of the younger cohort was 20 years and those reporting drip had an average

age of 19 years. The average age of the older cohort was 85 years and the average age reporting anterior nasal drip was 86 years.

In the younger cohort, 16 people stated they had nasal drip "sometimes," with 9 stating "yes." In the older group, this trend reversed with 46 stating "yes," and 15 "sometimes." The difference between the older and younger groups was strongly significant with a $p < 0.001$ (Fig. 2). The effect of gender was nonsignificant after accounting for

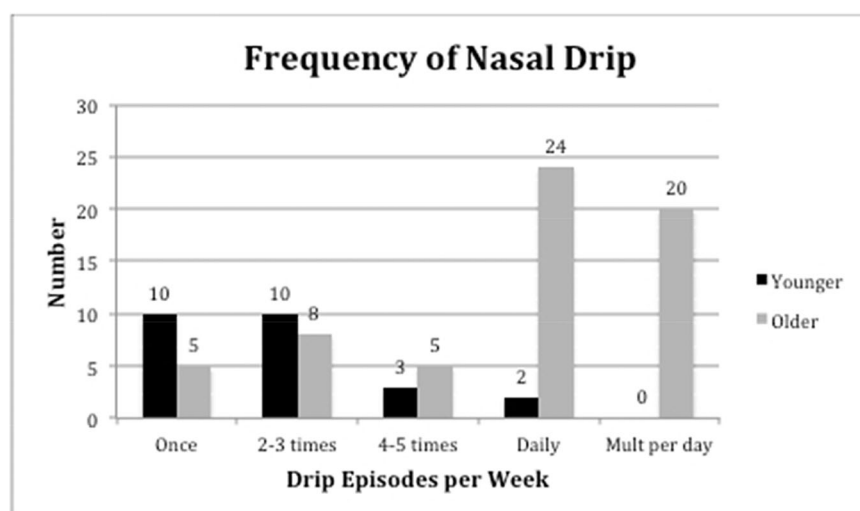


FIGURE 2. Clinical data from both age groups showing a strongly significant difference between the frequency of nasal drip in an older demographic than in the younger demographic ($p < 0.001$).

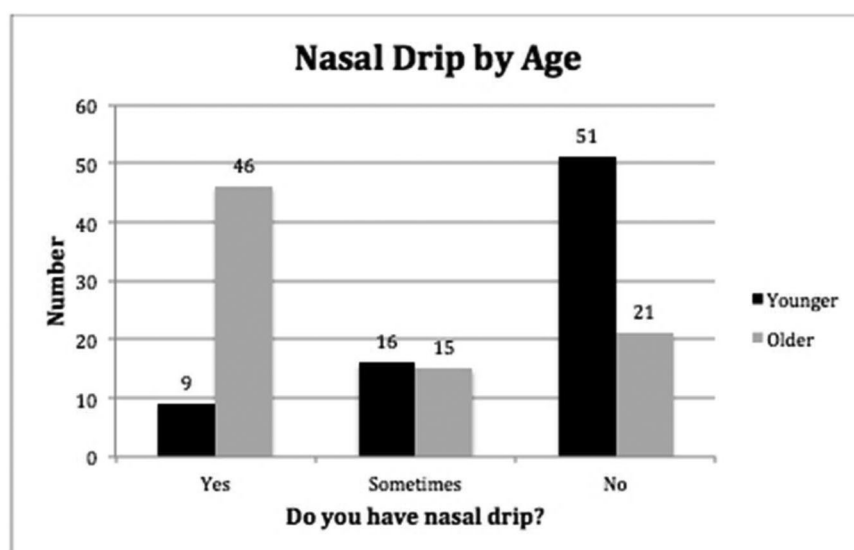


FIGURE 3. Representation of patients who stated they had nasal drip at least once per week in both age groups demonstrating that older individuals have more severe drip than the younger group ($p < 0.05$).

age differences. Seventy-two percent (72%; 44/61) of the older participants who had nasal drip had daily to multiple times per day drip, whereas only 8% (2/25) of young participants reported daily drainage (Fig. 3). Older participants reported drip more frequently and used more tissues per day than younger participants ($p < 0.05$).

When combining all individuals with nasal drip, 62% (53/86) of participants were slightly bothered by their drip without interference to their daily life; 10 (13%) were not bothered at all; 26% (23/86) were bothered in a moderate fashion that interfered, but did not prevent activities in their daily life. Only 1 person was significantly bothered and was prevented from activities because of the drip. A total of 33 respondents, 25 of those from the older group, would elect for treatment either medical or surgical to correct their nasal drip, with 51 declining treatment (Fig. 4).

Participants desiring treatment had drip more frequently, used more tissues, and were more bothered by drip ($p < 0.05$). Eleven younger and 21 older respondents had been tested for allergies. Fourteen younger and 25 older respondents had allergic symptoms either seasonal, year round, or both. There was no significant difference between not having allergies and having anterior nasal drip ($p = 0.18$). Duration of symptoms was not significant ($p = 0.058$). There was no clear relationship between smoking history, but very few of the subjects reported smoking in either group.

Discussion

Although the entity of clear, anterior rhinorrhea and its increased prevalence in an older population is widely

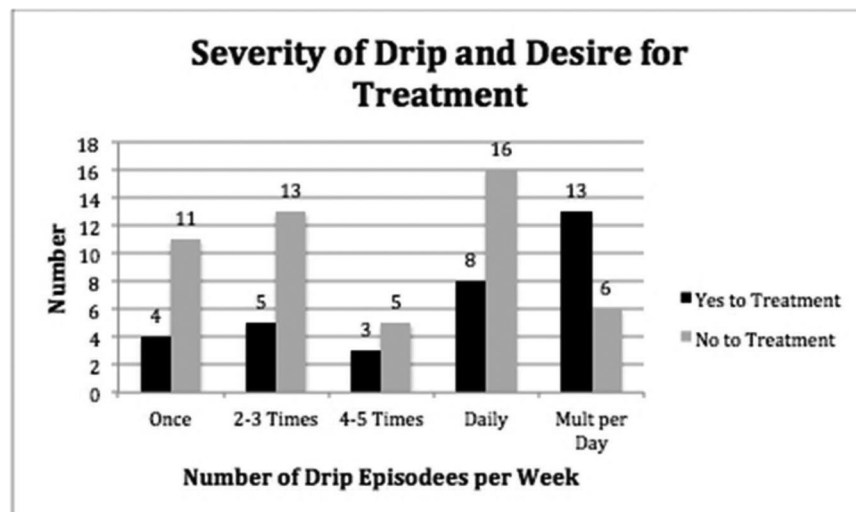


FIGURE 4. The more severe the nasal drainage the more likely an individual will seek medical or surgery therapy for symptom improvement ($p < 0.05$).

appreciated, we could find no studies that specifically showed that benign rhinorrhea increases with age. Based on the results of this study, it occurs significantly more frequently and with more intensity in older-aged subjects. Gender was not associated with the incidence of rhinorrhea. Subjects with more frequent drip were more likely to be bothered by the condition and interested in pursuing therapy.

The physiology underlying the etiology of rhinorrhea of aging is unknown. With aging, the sympathetic system is increased. However, the alpha-receptors and beta-receptors are less sensitive, which may lead to a decrease in sympathetic tone, and hence an increase in glandular reactivity in the nose via continued parasympathetic stimulation.⁵

We distributed the survey on a university campus and at a retirement community to gather participants at both extremes of age. Although this clearly eliminated individuals of middle age, it was our hypothesis that as one ages clear anterior rhinorrhea worsens; therefore, we hoped to gain a more clear difference by selecting people decades apart in age.

Limitations of this study include selecting only subjects who noted drip at least once a week, lack of rigorous medical histories for these patients, and the intrinsic weakness of surveys. During the creation of this survey multiple iterations were tested. Despite the population, if patients' had more significant drainage they used more tissues and more strongly desired treatment. Congruency of answers for questions gathering the same information was used in the validation of the survey. Initially we surveyed patients in the otolaryngology clinic of the senior author (BJF). Analysis of that cohort by age showed no significant difference. This finding illustrates the bias a population cohort can bring to a study and why particular groups responses cannot necessarily be extended to a normal population. The patient population of a tertiary rhinology practice is primarily treating people with sinonasal complaints, and

hence, nasal drainage was prevalent in all ages. Although this initial survey did not show the expected findings, it did provide data to refine our nasal drip survey. By surveying the general community at 2 extremes of age, it was our hope to eliminate the bias of using only patients from the sinonasal disorders and allergy clinic.

In a study published in 2012 of self-reported allergic rhinitis and chronic nasal symptoms among adults in Sweden aged 20 to 80 years, 14.1% of participants reported chronic rhinorrhea.⁶ Chronic rhinorrhea was evenly distributed by age with the highest prevalence between 20 and 30 years old at 16.7% (range, 12.5% to 16.7%). The Swedish survey was not validated for nasal drip and covered a large number of symptoms in a general way. Moreover, the incidence of nasal drip of 33% in our younger group, with a mean age of 20 years was higher than the Swedish study. By specifically refining severity and frequency of nasal drip, we were able to demonstrate large differences in rhinorrhea rates between the young and the old. This is the first survey that definitively validates the occurrence of increased nasal drip in the older population.

We also propose that the entity of increased clear anterior nasal drip be known as the "rhinorrhea of aging," rather than the previously used term of "senile rhinorrhea," which in this day and age carries a pejorative connotation. In a Google search, "senile rhinorrhea" yielded 36 results, whereas a similar search for "rhinorrhea of aging" yielded only 3 results.

Conclusion

Rhinitis of aging is an entity that affects an older age distribution and is often overlooked. The more frequent and bothersome the nasal drip, the more likely individuals would elect to pursue therapy. We propose the term "rhinorrhea of aging" for this entity, rather than

“senile rhinorrhea.” This study demonstrates for the first time that rhinorrhea of aging is a significantly more common symptom in the older adult, regardless of gender. 

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References

1. Sahin-Yilmaz AA, Corey JP. Rhinitis in the elderly. *Clin Allergy Immunol*. 2007;19:209–219.
2. Tan R, Corren J. Optimum treatment of rhinitis in the elderly. *Drugs Aging*. 1995;7:168–175.
3. Janzen, VD. Rhinological disorders in the elderly. *J Otolaryngol*. 1986;15:228–230.
4. Slavin RG. Special considerations in treatment of allergic rhinitis in the elderly: role of intranasal corticosteroids. *Allergy Asthma Proc*. 2010;31:179–184.
5. Hotta H, Uchida S. Aging of the autonomic nervous system and possible improvements in autonomic activity using somatic afferent stimulation. *Geriatr Gerontol Int*. 2010;10(Suppl 1):S127–S136.
6. Eriksson J, Ekerljung L, Rönmark E, et al. Update of prevalence of self-reported allergic rhinitis and chronic nasal symptoms among adults in Sweden. *Clin Respir J*. 2012;6:159–168.