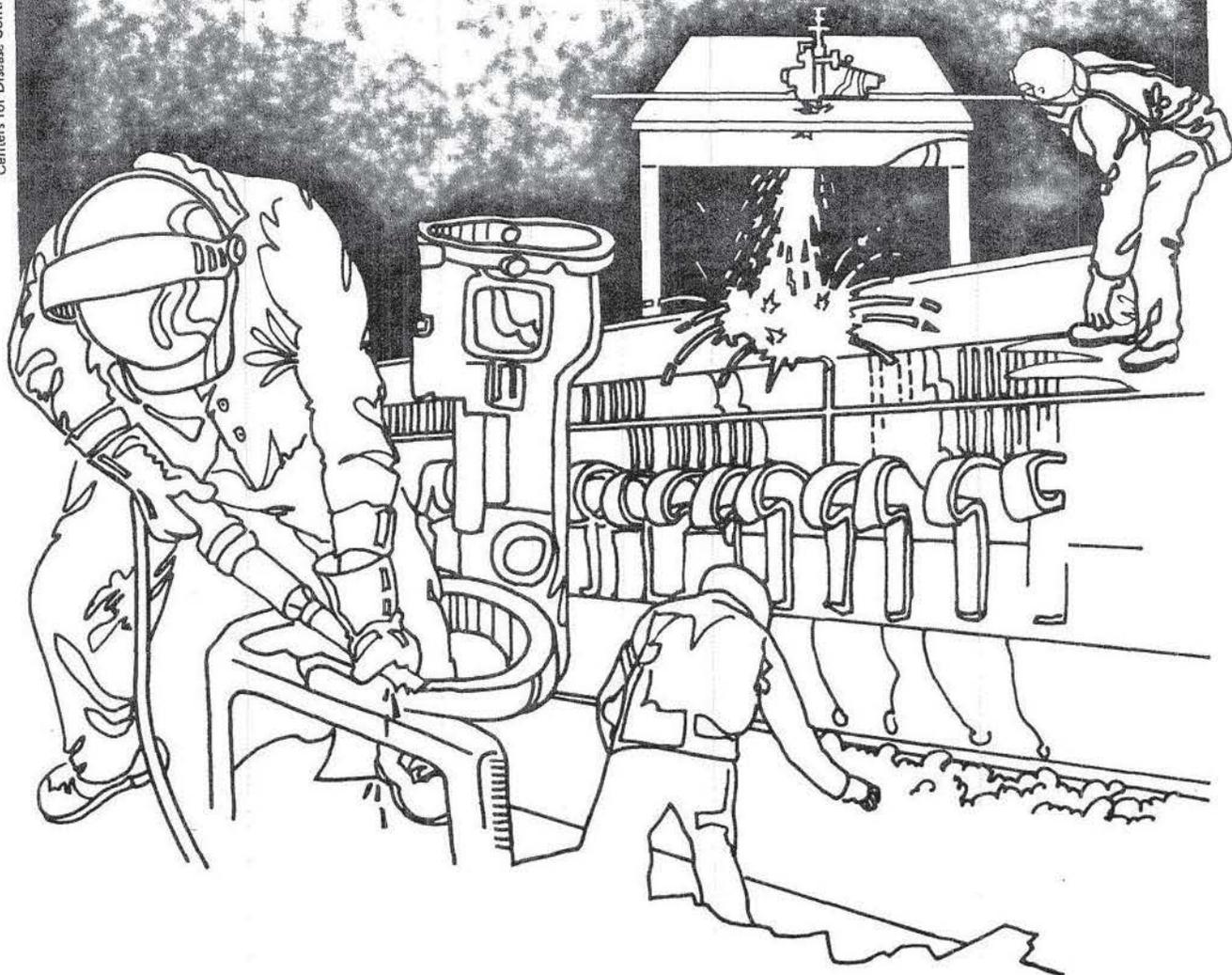


NIOSH



Health Hazard Evaluation Report 80-003-785

PREFACE

The Hazard Evaluations and Technical Assistance Branch of NIOSH conducts field investigations of possible health hazards in the workplace. These investigations are conducted under the authority of Section 20(a)(6) of the Occupational Safety and Health Act of 1970, 29 U.S.C. 699(a)(6), which authorizes the Secretary of Health and Human Services, following a written request from any employer or authorized representative of employees, to determine whether any substance normally found in the place of employment has potentially toxic effects in such concentrations as used or found.

Mention of company names or products does not constitute endorsement by the National Institute for Occupational Safety and Health.

HE 80-003-785
DECEMBER 1980
STEVEN JANOWITZ, D.D.S.
ALEXANDRIA, VIRGINIA

NIOSH Investigators:
John M. Horan, M.D.
John Love, I.H.

I. SUMMARY

On October 25, 1979 NIOSH received a request for a Health Hazard Evaluation at the office of Steven Janowitz, D.D.S. The employees were concerned about an apparent excess number of urinary tract infections among female staff members.

Personal interviews and review of available medical records revealed that 40 women have been employed by the dental office since it opened in 1976, and 12 of them were reported to have had urinary tract infections while employed.

We assumed every unconfirmed report represented an infection. In addition, two individuals with multiple recurrent symptomatic episodes were assumed to have the attack rates found in a previous study of women with recurrent bacteruria. Even with these "worst case" assumptions, the number of reported infections at the office is not significantly greater than the expected number in a female population with a history of recurrent urinary tract infection.

We cannot say whether the number of infections is greater than that experienced in the general population of otherwise healthy women because a review of the literature revealed no data on the incidence of urinary tract infections in the general female population. It is possible, however, that voiding habits among women at the office are influenced by untidy or unsanitary conditions in the public bathroom facility and that more frequent voiding might decrease the incidence of infections.

The chemicals used in the office include mercury, nitrous oxide, and Cidex,* a liquid cleaning agent; and there is no reported direct causal association between these agents and urinary infections. If the public bathroom were maintained in satisfactory condition, frequent voiding habits would probably be easier to follow. If the public facilities are inadequately maintained or are too often unavailable because of other users, then the dental office should provide a bathroom for employees.

KEYWORDS: SIC 8021 (Office of Dentist), Mercury, Nitrous Oxide, Urinary Tract Infections

*Inclusion of trade name is for identification only and does not imply endorsement by NIOSH

II. INTRODUCTION

On Thursday, November 8, 1979, NIOSH responded to a request from employees at the office of Steven Janowitz, D.D.S. for evaluation of an apparent excess of urinary tract infections among female staff members. The office opened in July, 1976. At the time of the investigation, there were 21 employees: eight dentists, two hygienists, four receptionists, six assistants, and one office manager. The office provides service for about 500 patients per week.

III. BACKGROUND

A walk-through survey was conducted on Thursday, November 8, by a NIOSH physician. Chemical agents used in the office include mercury and nitrous oxide for dental procedures and a liquid cleaning agent for some sterilization procedures. A literature search revealed no reports that these agents are directly responsible for urinary tract infections.

IV. METHODS

On Thursday and Friday current and former employees with a history of urinary infection while employed were interviewed in person or by telephone. The list of former employees with infections was generated from recall by the current office staff. When available, pertinent information about their infections was obtained from their physicians.

V. RESULTS

Including current staff and excluding one woman dentist, 40 women have been employed by the dental office since it opened in 1976. Twelve of the 40 (30%) were reported to have had urinary tract infections while employed. Their average age was 24.3 years (range 20-33 years), and the average age of the asymptomatic women employees was 26.8 years (range 19-33 years). No relationship was found between job category or duration of employment and risk of infection.

The cases included one person with a single episode of cystitis, six with more than one episode of cystitis, one with hemorrhagic cystitis, one with pyelonephritis, one with an unknown diagnosis, and two persons with chronic recurring symptoms of cystitis. Confirmation of these diagnoses was not available in all cases. Urine cultures were done in some instances and revealed the common urinary bacterial pathogens E. coli or P. mirabilis or possible contaminants S. aureus and S. epidermidis. Because the data are incomplete, the exact number of urinary tract infections that occurred among the cases while employed is not known.

Possible common sources of infection such as a shared supply of tampons or a common area for changing clothes and collecting laundry were considered; but there was no evidence of inadequate hygiene or clustering of cases in relation to these.

VI. DISCUSSION

If one assumes the extreme (or "worst") situation that each unconfirmed report represented an infection, there were 20 urinary tract infections among the 12 cases since the office opened in 1976. This number includes the documented episodes of infection in the two cases with chronic recurrent symptoms. It does not include all the recurrent symptomatic episodes of these cases because the individuals did not recall the total number of episodes.

Kraft and Stamey,¹ in a study of the history of recurrent bacteriuria among women, found that the "attack rate" of urinary tract infection in women with a history of recurrent urinary infections was about 0.17 infections per month. In addition, these women had temporal clustering of infections, and during this time of clustering the attack rate was 0.47 infections per month. These figures can be used to calculate "expected" numbers of urinary tract infections at the dental office and compare them with the numbers observed.

Table I shows observed versus expected numbers of urinary infections for the entire non-dentist female staff and for the cases. The observed numbers are less than expected except when only the cases are considered and the higher attack rate is attributed to the two with chronic recurrent symptoms. It is improbable that these two had the higher attack rate for the entire duration of their employment; but, even if this were so, the observed number is approximately equal to what is expected.

The entire population of current and former employees was not interviewed, hence there may have been some cases who were not reported. In addition, there may have been some unreported cases of asymptomatic infections.* Nevertheless, the number of reported infections at the office is not greater than the expected number in a female population with a history of recurrent urinary tract infection. We cannot say whether the number of infections is greater than that experienced in the general population of otherwise healthy women because a review of the literature revealed no data on the attack rate of urinary tract infections in the general female population.

Dr. Calvin Kunin, a noted authority on urinary infections in women, states that 25-35% of women between 20 and 40 years old give a past history of urinary tract infections. On the basis of this information and the data from Kraft and Stamey, it appears that the incidence of urinary infection in this population is not greater than expected.

*The number of asymptomatic infections may be small. The study by Kraft and Stamey found that only 6% of all infections were asymptomatic bacterurias identified by monthly screening cultures.

Several factors are thought to be related to occurrence and recurrence of urinary tract infection in otherwise healthy women. These include age, sexual activity, pregnancy, and voiding habits.

In a recent study by Adatto et. al.,² a group of young women (18-35 years old) with a history of recurrent urinary tract infection was compared to a control group without a history of infection. The authors found that "the most striking difference in patient and control group behavior was the high frequency of voluntary urinary retention in the patient group." The reasons often cited by the patients for deterring urination included unwillingness to use public toilet facilities or to interrupt their activities. Another study, by Lapidés et. al.,³ also found infrequent voiding to be one of the causes of recurrent urinary tract infection in women. The reasons for infrequent voiding included concern about interrupting activities or fear of contracting infection from public toilet facilities.

At the Janowitz dental office, the only bathrooms on the floor were public facilities located outside the office and shared with patients and members of other offices. It was the consensus of most of the women employees of the dental office that the women's bathroom was frequently not clean, and therefore many of them were reluctant to use it. It is interesting that two of the cases in this investigation, who were encouraged by their physicians to void more frequently, have not had subsequent recurrent urinary tract infection, although they have used the hall bathroom more frequently. If the bathroom were maintained in satisfactory condition, frequent voiding habits probably would be easier to follow. Maintenance of sanitary public bathroom facilities is a concern of the Bureau of Consumer Health. Requests for assistance can be addressed to:

Mr. Arnold Clark, Bureau Chief
Bureau of Consumer Health
District of Columbia Environmental Services
415 12th Street
Washington, D.C.
(Telephone: 202/724-4113)

VII. RECOMMENDATIONS

1. Recommendations for preventing recurrent urinary infections among women often include increased oral fluids, regular and frequent voiding, voiding shortly after intercourse, and periurethral hygiene. NIOSH does not endorse any one particular regimen. Rather, an individual should decide with her personal physician what is the optimum regimen for her.

2. NIOSH does recommend that employees have available adequate bathroom facilities and have reasonably frequent opportunities to use them. If available public facilities are inadequately maintained or are too often unavailable because of other users, then the dental office should provide a bathroom for employees.

3. As noted above, case confirmation, and perhaps also case reporting, was incomplete in this study. NIOSH will remain available to employees at the office and pursue the investigation further if it appears the rate of infections is increasing.

VIII. REFERENCES

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6. Medical Research Council Bacteriuria Committee: Recommended Terminology of Urinary Tract Infection. *BMJ* 2: 717719, 1979.

IX. ACKNOWLEDGEMENTS

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X. DISTRIBUTION AND AVAILABILITY OF DETERMINATION REPORT

For the purpose of informing the "affected employees" the employer should post this report for at least 30 days in a prominent place(s) near where employees work.

Copies of this report will be available from NIOSH, Division of Technical Services, Information Resources and Dissemination Section, 4676 Columbia Parkway, Cincinnati, Ohio 45226 for 90 days. Thereafter, copies will be available from the National Technical Information Service (NTIS), Springfield, Virginia. Information concerning its availability through NTIS can be obtained from the NIOSH Publications Office at the above Cincinnati address.

TABLE 1

Observed vs. Expected
Numbers of Urinary InfectionsSteven Janowitz, D.D.S.
Alexandria, Virginia

HHE 80-3

	<u>Number</u>	<u>Person-Months of Employment (7/76 - 11/79)</u>	<u>Number of Infections</u>		
			<u>Observed</u>	<u>Expected</u>	
			<u>A</u>	<u>B</u>	
All non-dentist female employees	40	542	32	54	92
Cases	12	305	32	54	51

Person-Months

Since the office opened in July, 1976, there were 542 person-months of employment by the non-dentist female employees; and the cases accounted for 305 of those person-months.

Observed Number of Infections, Column A

Twenty urinary infections were reported among the office staff. In addition, there were two persons with multiple recurrent symptoms of cystitis. The total number of episodes experienced by these two is not known. If they are considered to have the attack rate of 0.17 infections per month that Kraft and Stamey found in women with recurrent bacteriuria, then the total number of urinary tract infections among all the cases would be increased to approximately 32.

Observed Number of Infections, Column B

If the two persons with chronic recurrent symptoms had the higher attack rate of 0.47 per month, then the total number of urinary infections among all the cases would be increased to approximately 54. This higher rate was found by Kraft and Stamey during intervals of several months when women with recurrent bacteriuria had clustering of infections. It is unlikely that the two persons with recurrent symptoms had this higher attack rate for the entire duration of their employment.

Expected Number of Infections

Expected numbers are calculated by multiplying 0.17 times the number of person-months.

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