

Sale of Antibiotics without Prescriptions in Alexandria, Egypt

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Over the counter sale of antibiotics represents a worldwide threat and is progressively recognized as a basis of antibiotic misuse. In addition, it upsurges treatment costs, adverse effects of treatment, and development of resistance. The excessive practice of over the counter sale of antibiotics in Egypt rings a bell for the bad need to explore why such dispensing is taking place. The current study targets exploring the full picture of over the counter sale of antibiotics in the community pharmacies of Alexandria, Egypt. A phenomenological qualitative study was carried out in 25 randomly selected community pharmacies in Alexandria, Egypt. A community pharmacist from each community pharmacy was interviewed using a semi-structured open-ended interview. Moreover, professionals' dispensing practice was observed at each community pharmacy for at least two hours on the same day using an observation checklist. Answers were grouped into certain categories according to the objectives. All respondents indicated that antibiotics were commonly dispensed without prescription, and 60 % of them asserted that such a dispensing trend is progressive. The results showed that the nonprescription sales of antibiotics were common for Amoxicillin, Ciprofloxacin, and Azithromycin. Of the several categories of the population, the poor, under educated, and younger groups were recurrently reported for requesting antibiotics without prescription. The underlying causes for such trend were found to be associated with community pharmacy owner's impact to achieve the best revenue, customer's pressure, and underdeveloped regulatory system.

Keywords: Antibiotics, Over the counter, Nonprescription sale, Antibiotic resistance, Antimicrobial resistance, Community pharmacy, Alexandria, Egypt.

A lot of worldwide efforts are exerted to control infectious diseases. However, the decline of efficacy of antibiotics is increasing, and antimicrobial resistance has become a global threat¹. The inappropriate use of antibiotics is a significant driving force for the increased antibiotic resistance, as highlighted by the World Health Organization

(WHO)². The inappropriate use of antibiotics leads to the development of resistant population of bacteria in patients; selective pressure³.

Due to the compromised hygienic conditions that intensify transfer of genes, antibiotic resistance is worsened in developing countries⁴⁻⁶. Egypt is one of the many middle-income countries where antibiotics are accessible and dispensed at community pharmacies without prescriptions⁷, albeit that according to Egyptian law, dispensing antibiotics without prescription is illegal^{8,9}.

Scicluna and colleagues carried out a study in southern and eastern Mediterranean countries, and the results showed that 30% of Egyptian respondents had self-medicated with antibiotics⁷. This rate was 50 % greater than the other Mediterranean countries surveyed in the study⁷, and approximately six times the percentage reported from a similar European study¹⁰. The

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results of an active surveillance for resistant infections conducted in 3 large university hospitals in Egypt between September 1, 2006, and June 30, 2007 revealed high rates of β -lactam and methicillin-resistant *Staphylococcus aureus*¹¹.

The higher burden of infectious diseases along with the limited access to new antibiotics propose a bigger problem in low and middle-income countries compared to high income countries¹². In addition, this is worsened in low or middle-income countries by the incapability of paying for second-line drugs¹³. The sale of antibiotics without prescriptions is one of the main reasons to intensify antibiotic consumption which in turn accelerates development of resistance¹⁴⁻¹⁷. Improper enforcement of drug regulations is contributing to the inappropriate antibiotic consumption in Egypt¹⁸. A lot of studies were carried out to study the antibiotic resistance in Egypt. However, there are no enough studies to explore and depict antibiotic prescribing and dispensing practices by physicians and pharmacists. Most importantly, there exists only one recent conference abstract reported on a study that investigated antibiotic dispensing practices in Alexandria⁹. This study was carried out to try cover this gap and add to the results of the few published studies¹⁸⁻²³. The objective of this study is to explore the underlying causes of the sales of antibiotics without prescriptions in Alexandria, Egypt.

METHODS

Study Design

A phenomenological qualitative study was carried out where in-depth interviews along with observations were used to generate information on community pharmacists' antibiotic dispensing practice and the reason behind selling antibiotics without prescriptions. The study was conducted in Alexandria (second biggest city in Egypt) between November 1st, 2017 and November 25th, 2017. The community pharmacies were randomly selected for the study. Interviews with community pharmacists were held during their paid shifts. The interview questions were divided into 2 parts; the first was targeted at personal and professional information as the pharmacist's age, professional experience and education, while the purpose of the second part was to explore the pharmacist's opinion

regarding the current antibiotic dispensing practice and the reasons behind it. The average duration of the interview was 30 minutes, and in some cases where an interview was interrupted by customers, it reached 65 minutes.

In addition to the interview, observation of pharmacy professionals' dispensing practice was done at the same community pharmacies for a supplementary hour during a peak time using a checklist designed for this purpose. Observations were concerned with the categories of customers who commonly request antibiotics without prescriptions, the most common purchased antibiotics, the dispensing practices, and the extent of nonprescription sale of antibiotics.

RESULTS

Antibiotic Dispensing Practice

All respondents (100 %) agreed that antibiotic dispensing practice was not up to the principles set by the regulatory bodies. In addition, they stated that most of the community pharmacists typically do not follow the regulatory guides of good dispensing practice although they know very well that selling antibiotics without prescription is a growing public health threat. A considerable number of respondents (60 %) stated that the trend of nonprescription dispensing of antibiotics is progressive.

Categories of customers requesting antibiotics without prescriptions

Customers from all categories of population opt for buying antibiotics without prescription. However, the poor, undereducated, and younger people were the most frequent categories found to request antibiotics without prescriptions.

Antibiotics commonly sold without prescription

The results showed that the nonprescription sales of antibiotics were most common for Amoxicillin, Ciprofloxacin, and Azithromycin. These antibiotics were recognized for supposed treatment of various infections e.g., tonsillitis.

Reasons behind the Nonprescription Sales of Antibiotics

All respondents (100%) claimed that the situation of dispensing antibiotics without prescriptions in Alexandria was becoming common, and that this practice has main three reasons. The

identified reasons were linked to customers, owners, and regulatory bodies.

Customers' Demand

The results revealed that the constant customers' demand is an important reason for the sustained trend of sale of antibiotics without prescriptions. All respondents (100%) stated some factors that lead to this continuous customers' demand; customers' prior experiences, their limited awareness about the risks associated with nonprescription use of antibiotics, the struggle and the long time they wait at healthcare institutions until getting prescriptions, and the tendency and need to avoid the high cost of visiting physicians for diagnosis especially if they are familiar with the symptoms and have previous experiences of getting better upon taking the antibiotic(s) they request for.

It is worth noting that the majority of respondents (80%) stated that when they try to advise the customers to visit healthcare institutions, customers refuse the advice. In addition, they see that if they stop dispensing antibiotics without prescriptions, customers will get it effortlessly from other community pharmacies, and the community pharmacy that will insist not to sell without prescriptions will lose its customers and eventually the business will be affected.

Owner's Expectations

All participants (100 %) stated that owners do not allow them to stop dispensing antibiotics without prescriptions; they all agreed that the owner's impact is a main reason for this sustained trend.

Weak Regulatory Mechanism

All respondents (100%) confirmed that the weak regulatory system that fails to enforce restrictions to nonprescription sale of antibiotics is a key reason for this sustained trend; they all agreed that customers' demand and owners' influence are reinforced by the weak regulatory mechanism. Fifty-two per cent of the respondents called for strong regulations to control the sale of antibiotics, strictly forbidden the nonprescription sales, and penalize violators.

DISCUSSION

The results of the study showed that nonprescription sale of antibiotics in Alexandria,

Egypt is a common trend. Wrong choices of antibiotics, and insufficient doses to customers are well recognized to result from nonprescription dispensing of antibiotics^{24,25}. Such practice results in serious adverse reactions and masking of underlying infections which apart from that could have been easily detected and properly treated at early phase²⁶. The sale of antibiotics without prescriptions has been identified as one of the prime causes that hasten the development of antibiotic resistance²⁷. The nonprescription sale of antibiotics represents a worldwide problem, and therefore it is better to be approached from a global perception²⁵. At the same time, it is worth noting that the reasons behind the nonprescription sales of antibiotics may differ among countries due to the various settings and backgrounds²⁸.

In the current study, all respondents know very well that selling antibiotics without prescription is a growing public health threat. On the contrary, the majority of interviewed population in a similar study carried out in an Indian village lacked the required knowledge about antibiotic resistance²⁹. There is a need for a formal source about antibiotic resistance to support and help improve prescribing and dispensing practices especially in developing countries.

The trend of nonprescription sale of antibiotics was seen "progressive" by 60 % of the respondents. In 1996, Benjamin *et al.*³⁰ carried out a study to examine the patterns of drugs dispensing in Alexandria. Regarding the dispensed anti-infective products, (50.4%) were sold upon customers' request with no prescription or recommendation from the pharmacist. Later, in 2012, in a study that analyzed the dispensed drugs in Alexandria, it was found that 42 % of antibiotics were sold without prescription. However, we cannot accurately tell if the trend is progressive in Alexandria or not due to the lack of studies and the different settings of the published studies.

In the surveyed community pharmacies, the most frequent categories found to request antibiotics without prescriptions were the poor, undereducated, and younger people.

Different results were obtained in a study published in 2009³¹, which investigated self-medication in adults attending pharmacies in Alexandria, where regarding age, 27.9% of purchasers of self-medication were aged 20–29

years, and regarding educational level, 52.5% were university graduates, whereas 16.6% and 19.8% respectively were uneducated or could just read and write. Nevertheless, it is difficult to analyze the difference of results due to the absence of an acceptable number of published studies, and the varied settings of the published studies.

Amoxicillin and Ciprofloxacin were found among the antibiotics commonly requested by customers in a similar study conducted in Addis Ababa, Ethiopia. In a similar study carried out in Cairo, Egypt from the beginning of September until the end of November 2011, different results were obtained where Amoxicillin, Ciprofloxacin, and Azithromycin were dispensed in response to customer request with the percentages (16.3 %), (2.22), and (4.44 %) respectively²³.

Customers' demand, owner's expectations, and weak regulatory mechanism were found to be the reasons behind the Nonprescription Sales of Antibiotics as seen by all the respondents. In a study that was carried out in Egypt in 2011 to explore the factors that affect nonprescription sales of antibiotics, the profit was also found to be a main reason for such practice⁸. In a similar study in Addis Ababa, Ethiopia, the main reasons were owner's impact in order to maximize profit, customer's pressure, weak regulatory mechanism and professional conflicts of interest²⁸. These findings support the need for strict enforcement of pharmacy laws through improved inspection processes, and highlight the need for evidence-based guidelines and educational interventions to improve antibiotic prescribing and dispensing practices.

CONCLUSION

The study shows that dispensing antibiotics without prescriptions is a common practice in Alexandria, Egypt. The poor, undereducated, and younger people were the most frequent categories found to request antibiotics without prescriptions. Amoxicillin, Ciprofloxacin, and Azithromycin were the most common requested antibiotics. The key reasons for such practice are customers' demand, owner's expectations, and weak regulatory mechanism.

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