Hindawi
Advances in Public Health
Volume 2020, Article ID 8816785, 6 pages
https://doi.org/10.1155/2020/8816785

Research Article

Characteristics and Indications of Legal Abortion among the Pregnant Women in Lorestan Province of Iran during 2017–2019

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Received 17 July 2020; Revised 26 November 2020; Accepted 14 December 2020; Published 22 December 2020

Academic Editor: Hamidreza Karimi-Sari

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Background. Legal abortion is a challenge from the viewpoint of ethics and religion. The present study was conducted to investigate the frequency of fetal and maternal indications of legal abortion and also the maternal characteristics in Lorestan Province of Iran. *Methods*. As a descriptive cross-sectional study, all the cases with issued permits for legal abortion were selected by a census during 2017–2019. Descriptive data analysis was used to report the results. Event rates with Poisson 95% confidence intervals (CIs) were calculated based on the regional population. *Results*. A total of 305 cases were selected. The mean age of the mothers was 31.61 ± 7.48 years, and the mean of gestational age was 15.76 ± 2.80 weeks. Demographically, most cases were from Khorramabad city (101 cases) followed by Borujerd (51 cases) and Doroud (46 cases). The overall event rate was 1.732 per 10,000 individuals (95% CI: 1.543–1.938) of the general population of the region per 3 years. Fetal disturbance of the brain and spine was the most prevalent reason of abortion (24.92%, 95% CI: 19.63%–31.19%) followed by Down syndrome (19.34%, 95% CI: 14.73%–24.95), hydrops fetalis (12.79%, 95% CI: 9.09%–17.48%), and anencephaly (12.79%, 95% CI: 9.09%–17.48%). *Conclusion*. From each 10,000 individuals of the population, one to two cases of legal abortion were screened per 3 years. More than 90% of cases had fetal indication. In cities with lower event rates, we should plan for better screening.

1. Introduction

From the days of yore, abortion induction of a fetus (or an embryo) had been an illegal and immoral action [1, 2]. However, nowadays, physicians try to suggest some exceptions for abortion and call it as legal abortion [3]. The reasons of legal abortion can be different, and they are mainly therapeutic abortion (to save mother's life) and abortion due to fetal defects [4]. Abortion is defined as removal of an embryo or a fetus from the uterus before the stage of viability. Therapeutic abortion is an induced abortion performed for therapeutic aims [5].

Although legal abortion is still a controversial issue, many countries perform it for therapeutic aims using medication induction or surgical intervention. At least from mid-twentieth century, therapeutic abortion was commonly performed. For instance, in 1970, intravenous prostaglandin E2 and prostaglandin F2α were used for drug-induced therapeutic abortion [6, 7]. Puerperal mortality was a big deal in the United States as a country-permitted therapeutic abortion [8]. Canada decriminalized therapeutic abortion about 30 years ago. The trend for the place of abortion is shifting from hospitals to clinics [9]. In spite of the problems, since therapeutic abortion had been a necessary procedure, many studies were performed to reach epidemiological information, solve the problems, and reduce the complications. An epidemiological study in Scotland (1980–2008) showed that therapeutic abortion was associated with increased risk of preterm birth, but modernizing the methods could reduce this risk [10]. Islamic countries such as Iran conducted many epidemiological studies on the therapeutic abortion. Iran is an Islamic country which resolved the legal and jurisprudential limitations of therapeutic abortion in the recent years [11]. Nevertheless, the Iranian midwives have

moderate awareness and low attitude about the abortion law [12]. Mahdavi et al. reported the status of therapeutic abortion in Iran. During 2015–2017, a total of 15,617 permissions out of 21,477 applicants were issued. They used ICD-10 classification to categorize the maternal and fetal indications of therapeutic abortion [13].

Therapeutic abortion has maternal and fetal indications. Iran Ministry of Health has named many maternal indications for therapeutic abortion. In brief, they are cardiac reasons such as history of dilated cardiomyopathy in the previous pregnancy, gastroenterology reasons such as fatty liver of pregnancy, and many other internal or surgical diseases [14]. A complete list of the indications had been reported by Hedayat et al. [15] and by Bereshneh et al. [16]. This classification was a little different from ICD-10.

A gap of research is lack of a public scientific report on the regional data for legal abortion in many provinces of Iran as a polyethnic country. Although such reports are present for some provinces, the raw governmental information for other provinces without research approach cannot help the surveillance to promote the health of those regions. Different regions of the world countries have different cultures and health status. According to the importance of medical, ethical, and legal aspects of abortion, as well as anthropological and ethnic aspects of health, the present work was performed to study the frequency of the indications of legal abortion and maternal characteristics of the cases in Lorestan Province, west of Iran, during 2017–2019.

2. Materials and Methods

A descriptive cross-sectional study was performed. The samples were from Lorestan Province of west of Iran, and the sampling method was a census during 2017–2019. The place of study was one of the Iranian Legal Medicine Organization branches located in Khorramabad, Lorestan.

The ethics committee of the Lorestan University of Medical Sciences gave permission to use the present information in the current study (IR.LUMS.REC.1398.160). All the pregnant women referred for getting permit of legal abortion (and the permit was successfully issued) were imported into the study. The patients had given us informed consent for using their information for research aims. Patients who did not succeed in receiving permit were excluded from the study. Data were collected using a researcher-designed checklist under direct supervision of a gynecologist and a specialist of forensic medicine. The checklist consisted of mother age, city, urban or rural residency, mother education, gestational age, volume of amniotic fluid (categorical), gender of fetus, gravid- (G-) and para- (P-) abortion history, relativeness of parents, job of the mother, fetal defects in the relatives, and fetal or maternal reason of abortion.

Descriptive data analysis was used to report the results using SPSS 24 (IBM Corp, US). Event rates with Poisson 95% confidence intervals (CIs) were calculated based on the regional population (without considering the unit of time) using Stata 14 (StataCorp LLC, US).

3. Results

During the time of the study, a total of 305 cases of legal abortion were selected. The mean age of the mothers was 31.61 ± 7.48 in that the minimum age was 15 and the maximum age was 50 (Figure 1). The mean of gestational age was 15.76 ± 2.80 in which the minimum age was 6 weeks and the maximum age was 19.43 weeks (Figure 2).

Demographically, most cases were from Khorramabad city as the center of Lorestan Province (101 out of the total of 305 cases) followed by Borujerd (51 cases), Doroud (46 cases), and Kuhdasht (33 cases). About 79.0% of the patients were urban residents. The most frequent educational level was for diploma (33.1%) followed by guidance school (22.0%). The most frequent job of the mother was housewife (84.5%) followed by clerk (11.6%). Inferentially, the event rates in the cities were compared with the event rate in Khorramabad (2.705 per 10,000 individuals of the population per 3 years). Accordingly, Poldokhtar showed a significant increased event rate ($P = 0.006$), and Aligoudarz showed a significant decreased event rate ($P < 0.001$). The overall event rate was 1.732 per 10,000 individuals (95% CI: 1.543–1.938) of the population, i.e., 5000 couples (Table 1).

According to the gynecological characteristics of the patients, most patients were in their second pregnancy (30.4%), while most patients were gravid zero (34.8%). About 27.4% had a history of abortion. For the fetus gender, about 53.6% were girls, 42.9% were boys, and 3.6% were twins or triplets out of 168 cases with the documented fetus gender. Amniotic fluid volume was normal in about 94.3% of the patients. Indications of abortion were fetal in 93.4% of the patients, and the other patients had maternal indications (Table 2).

The fetal and maternal indications of therapeutic abortion were listed. Fetal disturbance of the brain and spine was the most prevalent reason out of the 305 cases (24.92%, 95% CI: 19.63%–31.19%) followed by Down syndrome (19.34%, 95% CI: 14.73%–24.95), hydrops fetalis (12.79%, 95% CI: 9.09%–17.48%), and anencephaly (12.79%, 95% CI: 9.09%–17.48%). The most prevalent maternal reasons were heart, neurological, and hematologic diseases (3 counts for each). Some cases had more than one reason (Table 3).

4. Discussion

We conducted the present study to investigate the indications of legal abortion in our province as well as demographic and gynecological characteristics of the pregnant women who were subjected for therapeutic abortion. From the overall population of Lorestan Province with 1,760,349 individuals, we had 305 cases of legal abortion during our three-year period of study. The mean age seems to be a little more than the mean age of pregnant women in the general population. The range of gestational age was according to the Iran law for permit of legal abortion (up to 19 weeks and 1 day of gestation).

As we expected, most cases were from Khorramabad city as the center of Lorestan Province followed by Borujerd as the second big city of the province. This province has a lot of

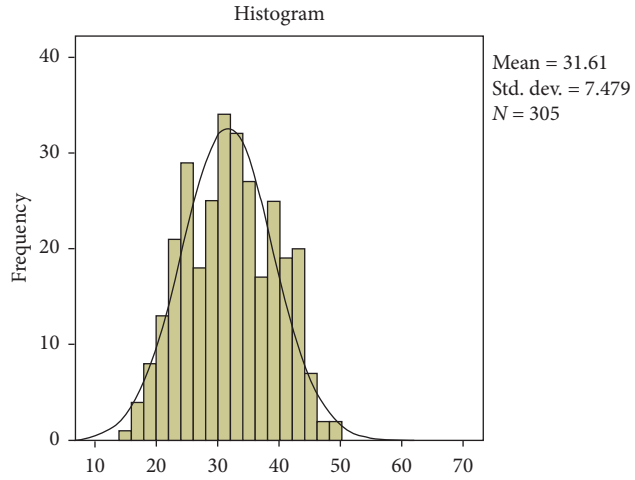

Figure 1: Distribution of maternal age.

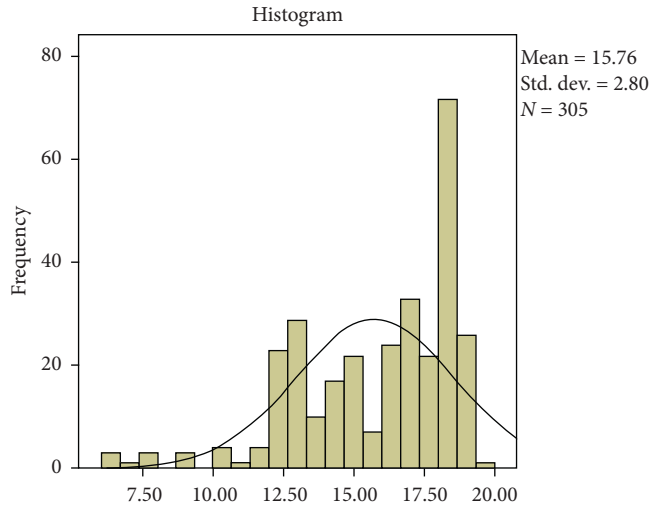

Figure 2: Distribution of gestational week.

Table 1: Demographic characteristics of the mothers and event rates of the cities.

City	Frequency	Percentage	Event rate (95% CI)[1]	Event rate ratio (P)[2]	Characteristics	Frequency	Percentage
Khorramabad	101	33.1	2.705 (2.202–3.287)	Reference	Residency		
Borujerd	51	16.7	2.237 (1.666–2.941)	0.827 (0.269)	Urban	241	79.0
Doroud	46	15.1	4.086 (2.990–5.447)	1.511 (0.024)	Rural	64	21.0
Kuhdasht	33	10.8	3.704 (2.550–5.202)	1.369 (0.124)	Overall	305	100
Nourabad	23	7.5	3.619 (2.294–5.431)	1.338 (0.215)	Mother education		
Poldokhtar	16	5.2	6.072 (3.470–9.860)	2.245 (0.006)*	Illiterate	27	8.9
Roumeshkan	8	2.6	3.470 (1.498–6.838)	1.283 (0.485)	Elementary school	41	13.4
Azna	7	2.3	1.474 (0.593–3.037)	0.545 (0.103)	Guidance school	67	22.0
Chegeni	5	1.6	1.197 (0.389–2.794)	0.443 (0.053)	High school (diploma)	101	33.1
Aleshtar	5	1.6	1.490 (0.484–3.477)	0.551 (0.178)	Postdiploma	15	4.9
Aligoudarz	4	1.3	0.448 (0.122–1.470)	0.166 (0.000)*	Bachelor	39	12.8
Zagheh	3	1.0	10.81 (2.229–31.58)	3.997 (0.049)	Master	15	4.9
Beiranshahr	2	0.7	11.63 (1.408–42.00)	4.391 (0.094)	Doctorate	0	0
Papi	1	0.3			Overall	305	100
Overall	305	100	1.732 (1.543–1.938)		Mother job		
					Housewife	109	84.5
					Clerk	15	11.6
					Self-employed	4	3.1
					Student	1	0.8
					Overall	129	100

(1) Based on the population of the cities using Poisson 95% CI ($\times 10^{-4}$); (2) two-tailed probability of $k \geq$ (or $\leq$) count (Khorramabad is the reference as the center of the province). *Significant at $P < 0.01$.

Table 2: Gynecological characteristics of the mothers.

Characteristics	Frequency	Percentage
Fetus gender		
Girl	90	53.6
Boy	72	42.9
Twin	5	3.0
Triplet	1	0.6
Overall	168	100
Number of pregnancies		
1	34	25.2
2	41	30.4
3	32	23.7
More than 3	28	20.7
Overall	135	100
Number of children		
0	47	34.8
1	38	28.1
2	36	26.7
3	6	4.4
More than 3	8	5.9
Overall	135	100
Number of abortions		
0	98	72.6
1	26	19.3
2	8	5.9
3 and more	3	2.2
Overall	135	100
Amniotic fluid volume		
Very low	10	3.5
Low	5	1.8
Normal	267	94.3
High	1	0.4
Overall	283	100
Fetal defects in relatives		
First-degree relatives	10	83.3
Second-degree relatives	1	8.3
First- and second-degree relatives	1	8.3
Overall	12	100
Indications of legal abortion		
Fetal	285	93.4
Maternal	20	6.6
Overall	305	100

villages, and therefore, nearly one-third of the cases were rural residents. About the educational level, an interesting thing was that 8.9% of the cases were illiterates in spite of being in the age range of newer generations. It shows that education as a social determinant of health may affect the health of the fetus. There was no individual with a doctorate degree. Most of the mothers were housewives that is common in the culture of Iran. The event rates of the cities were compared with the event rate of Khorramabad city. Poldokhtar showed a significant increased event rate (more than two times of Khorramabad), whereas Aligoudarz showed a significant decreased event rate (about one-sixth of Khorramabad). In the case of increased event rate, we should study further for its reasons. It may be due to genetic, cultural, or environmental reasons that are not currently clear. In the case of decreased event rate, the reason may be missing of some cases because of traditional culture of that region. For gynecological characteristics, nearly one-third of the mothers had a history of abortion. More than 90% of the cases had fetal reasons for legal abortion. The most common fetal reason was malformation of the brain and spine (categorized as congenital malformations of the central nervous system in ICD-10 excluding anencephaly that we used it in a separate category) followed by Down syndrome. As we expected, Down syndrome was a common reason for legal abortion. More than half of our pregnant women were aged 30–50 (Figure 1). It can justify the high prevalence of Down syndrome for among the cases of therapeutic abortion.

Because of the role of the Islamic law in Iran and the jurisprudential approach to therapeutic abortion, this topic had been attractive for Iranian researchers, and many of the studies on legal abortion were conducted in this country. However, Iran is a polyethnic country, and therefore, the results may be different region by region. Hence, we conducted the present study in Lorestan Province of Iran with a focused approach under our direct observation. Sadr et al. performed a study on therapeutic abortion cases in 2003 before approval of the new law of legal abortion by the parliament in 2005. At that time, about 64% of the cases had fetal reasons. The mean of maternal age was 29.4, and the mean of gestational week was 12.8 (at that time, the maximum gestational age for permit was lower) [17]. In our study, the mean gestational week was 15.76 because of increasing the maximum gestational age of permit up to 19 weeks in 2005. Rahimparvar et al. studied maternal characteristics of legal abortion in Tehran during 2011-2012. About 92.2% of their cases had fetal reasons. Neurological abnormalities were the most prevalent reason similar to our study [18]. Ghodrati et al. studied the reasons of legal abortion among teenaged married mothers of Shiraz. There were 110 cases of fetal indication and 30 cases of maternal indication during 2006–2013. The most prevalent reason was major thalassemia [19]. Mahdavi et al. conducted an epidemiological study on all the provinces of Iran during 2015–2017. A total of 15617 permits were issued in which 91.99% had fetal reasons and 8.01% had maternal reasons. The most prevalent reason was nervous system malformation similar to our study [13]. Considering the population of Iran in 2017, their event rate was calculated as about 1.936 per 10,000 individuals per this period of time. 95% CI of our event rate in Lorestan Province crossed the event rate of Mahdavi et al.'s study showing lack of a significant difference in our region and our period of time. Of course, the time exposures were different. However, Khorramabad city showed higher event rate.

Like our study, there were some other provincial studies done in Iran. Soleimanpour et al. performed a study in Isfahan province. A total of 629 permissions were issued during 2012–2014. The most common indication was cephalic disorder of the fetus which was about 37.4% of the cases. Like our study, different cities of Isfahan province showed different distributions. The authors had concluded that these differences might be due to cultural, religious, and socioeconomic determinants [20].

Table 3: Distribution of maternal and fetal reasons of legal abortion.

Indications	Classification source	Frequency	Percentage	Poisson 95% CI
Maternal	LMO of Iran			
Heart disease	[16]	3	0.98	0.20–2.87
Neurological disease	[16]	3	0.98	0.20–2.87
Renal disease	[16]	2	0.66	0.08–2.37
Pulmonary disease	[16]	2	0.66	0.08–2.37
Hematologic disease	[16]	3	0.98	0.20–2.87
Others		7	2.29	0.92–4.73
Fetal disturbance	ICD-10			
Brain and spine[1]	Q01–Q07	76	24.92	19.63–31.19
Down syndrome	Q90	59	19.34	14.73–24.95
Hydrops fetalis	P56	39	12.79	9.09–17.48
Anencephaly	Q00	39	12.79	9.09–17.48
Musculoskeletal	Q67, Q68, Q79	15	4.92	2.75–8.11
Heart	Q20–Q26	15	4.92	2.75–8.11
Kidney and urinary tract	Q60–Q64	13	4.26	2.27–7.29
Hematological	P61	13	4.26	2.27–7.29
Gastrointestinal	Q39–Q45	13	4.26	2.27–7.29
Pulmonary	Q32–Q34	8	2.62	1.13–5.17
Other chromosomal	Q91–Q99	6	1.97	0.72–4.28
Others		512	1.643.93	0.53–3.832.03–6.87
Overall		305 (328)[2]	100 (107.5)	

Asadollahi et al. performed a study in Yazd Province. A total of 391 permissions were issued during 2017–2019. The most common indication was central nervous system disorder of the fetus accounting about 21.1% of the cases. There was no information for the cities of Yazd Province [21]. Sharafi et al. performed a study in Kermanshah Province. A total of 428 permissions were issued during 2005–2009. The most common indication was cerebral abnormalities of the fetus accounting about 70.8% of the cases. Their number of permitted issues seems low for this province in this wide time range. At that time, public awareness might be lower due to cultural and socioeconomic determinants [22].

Other than Iran, many other studies on legal abortion were conducted in other countries. For instance, a Brazilian study on 1283 cases showed that 94% of the cases were due to rape [23]. In Islamic law of Iran, rape is not a legal indication at least up to the time of our study. Therefore, Iranian studies had different approaches to legal abortion in comparison to other countries.

The limitation of this study was the lack of calculation of the event rate based on the population of the females being in the reproductive age. We did not have any data in this regard.

5. Conclusion

The event of indication for legal abortion in our province was about more than one case per 10,000 individuals of the population in a three-year period. Considering that one-fourth of the population are females in reproductive ages, about 2500 of such individuals should be screened to detect one or two cases of indication for legal abortion. Most cases had fetal indication in our study similar to other Iranian studies. In cities with lower event rates, we should plan for better screening. It is suggested that the incidence rate of therapeutic abortion should be calculated based on the number of pregnant women and the number of females in the reproductive age, and place and time unit should be regarded. It helps for better monitoring of surveillance.

Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

Ethical Approval

The ethics committee of the Lorestan University of Medical Sciences approved this study regarding privacy and secrecy (IR.LUMS.REC.1398.160).

Consent

Written informed consent was obtained from the participants.

Disclosure

This study was the MD thesis of Zahra Fatemi.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

Authors' Contributions

ZF collected the cases and provided the primary information. SA wrote the manuscript. Both authors read and approved the manuscript.

Acknowledgments

The authors thank Mr. Samad Darabian and Dr. Hamid Reza Nazifi for helping them in the present study. This study was supported by the Lorestan University of Medical Sciences.

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