

Ethnic disparities in perioperative management among foreigners residing in Japan

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Summary

The objectives of this research were to examine the current status of perioperative treatment among foreigners, to elucidate the health status/outcome disparities that contribute to ethnic differences, and to recommend counter-measures to rectify these ethnic disparities. The authors identified 36 non-Japanese and 111 Japanese females who underwent gynecological surgery from 2004 to 2009 at a single institution. Electronic medical records were reviewed and telephone survey was conducted in order to obtain patient background, preoperative, operative, and postoperative data. The non-Japanese group showed significantly larger number of uninsured, shorter length of stay (LOS), higher rate of emergency surgery, and higher cases of spinal anesthesia. There were significant differences in length of residency in Japan and LOS among four foreign countries. Seventy-nine percent of patients contacted by phone understood informed consent from doctors, 73.7% understood explanation in operating room (OR), and 84.2% understood explanation from anesthesiologists. This research was the first survey of the ethnic disparities in perioperative management among foreign patients treated in Osaka. The authors have demonstrated differences in operative method, emergency surgery, anesthesia, and American Society of Anesthesiologists physical status (ASA-PS) due to the difference in disease structure, language, and culture. It is recommended that the barriers between non-Japanese patients and medical staff are rectified during the perioperative period when mutual understanding is needed the most.

Key words: Foreign-residents in Japan; Perioperative; Gynecological surgery; Ethnic disparities.

Introduction

Since the 1980s, the number of registered foreign residents in Japan has increased continuously and their stay tends to be prolonged. According to a survey conducted by the Ministry of Justice [1] in 2008, the number of legally-registered foreigners had reached 2,217,000, which corresponds to 1.74% of the overall Japanese population.

Many foreign residents are subjected to cultural stress due to issues such as language, racial discrimination, education, healthcare, and these stresses prevent them from conceiving, delivering, and raising children in Japan [2-5]. For example, the current foreigner program in maternal and child healthcare (MCH), such as providing the MCH handbook in other languages, is not working to full capacity and is far from reaching the objectives of providing quality and accessible services to foreign residents. The majority of foreign residents are unaware of the range of services offered for maternal and child healthcare [6]. Population statistics for foreign residents in Japan show that 74% are in the reproductive age group [6] and their prolonged stay indicates that a further increase in them with gynecological and obstetric chronic illness who will undergo surgery can be expected. The number of perioperative medical errors which induce serious health disorders are expected to increase due to the rise in the overall number of surgical operations.

Studies of health inequalities have been the subject of

vast quantities of research within the last decade, and address the significant differences with respect to perioperative treatment, health status, and outcome according to countries such as the United States, England, and so on. Numerous studies have found that races such as Hispanics and Africans are likely to have less clinical follow up and worse clinical outcomes as compared to Caucasians [7, 8]. Hispanics and Africans are in worse health conditions from the beginning of their hospitalization. Even if communicated, it is difficult for these ethnic groups to obtain enough information and knowledge about their diseases due to race and educational level [9, 10]. A recent study found that socio-economic status (SES) is strongly associated to patients' choice of their treatment methods [11, 12]. Evidence that ethnicity and race are predictors of screening disparities, treatment variations, and health outcomes has been reported in medical and surgical literature [13-18]. However, there is no national report evaluating health disparities in perioperative treatment/health between non-Japanese and Japanese patients. Language barriers and cultural differences may become an obstacle to appropriate healthcare, and can induce misinterpretation even if translated [19, 20].

Thus, the purpose of the study was to examine the current status of perioperative treatment among foreigners residing in Japan, to elucidate the health status/outcome disparities that contribute to ethnic difference, and to recommend counter-measures to rectify those ethnic disparities.

Materials and Methods

Subjects

The authors identified 36 non-Japanese patients and 111 Japanese patients who underwent gynecological surgery from 2004 to 2009 at General Hospital C which serves as the primary provider of acute health care needs for Osaka and Eastern Hyogo district dwellers. In this study, the authors included obstetrical surgery, such as cesarean section during gynecological surgery.

Record review

The authors conducted a retrospective analysis of data including descriptive analysis of relevant clinical variables. Electronic medical records were reviewed in order to obtain data in four major categories: patient background, preoperative, operative, and postoperative data. These data were compared between non-Japanese and Japanese patients. Patient background included: age, length of residency in Japan, nationality, native language, marital status, husband's nationality, Japanese language level, and insurance status. Preoperative data included the American Society of Anesthesiologists physical status (ASA-PS) and use of interpreter. ASA-PS grading system was created to imply to assess the degree of a patient's "sickness" or "physical state" prior to selecting the anesthetic or prior to performing surgery. Operative data included: comprehension of explanation in operating room (OR), emergency surgery, operative method, anesthesia method, intraoperative blood loss, hemoglobin (Hb) and platelet levels. Postoperative data included: pain control frequency (analgesic use), patient-controlled analgesia (PCA) frequency, ambulation, length of stay (LOS), removal of urinary and epidural catheters, and medical cost.

Telephone survey

Telephone survey was conducted in order to obtain data in three major categories: comprehension of informed consent/anesthesia explanation, patients' supportive environment, and use of interpreter. Scale ranging from "very good" to "not at all" was used to evaluate foreign patients' own comprehensions of informed consent and anesthesia explanation.

Ethical consideration

The authors obtained an appropriate approval from the Institutional Review Boards at Kobe University before conducting the survey.

Statistical analyses

The differences in the distribution of baseline characteristics between the two (non-Japanese and Japanese) or four ethnic groups (Chinese, Korean, Philippino, and Latin American) were tested using the Chi-square test or Fisher's exact test, the Mann-Whitney's U test, the Student's t-test, and Kruskal-Wallis test for categorical and dichotomous variables and analyses of variance (ANOVA) with Scheffe's F post hoc test, Student's t-test, Mann-Whitney's U test, and Kruskal-Wallis test for comparison of continuous variables. Quantitative data were presented as means and standard deviations. All statistical analyses were carried out using STATCEL. Statistical significance was expressed as *p* values and 95% confidence intervals (CIs). A *p* value of < 0.05 was considered significant.

Table 1. — Comparison of patient characteristics between non-Japanese and Japanese patients.

	Non-Japanese (n = 36)		Japanese (n = 111)		<i>p</i>
	n	Mean ± SD	n	Mean ± SD	
Stay in Japan (yrs)	19	8.4 ± 6.6			
Age (yrs)	36	29.8 ± 7.2	111	32.9 ± 6.8	0.02
Marital status					
Married	28	77.8%	85	76.6%	0.50
Partner	1	2.8	2	1.8	
Unmarried	6	16.7	13	11.7	
Husband					
Japanese	13	44.8%			
Same nationality	7	24.1			
Different nationality	1	3.5			
Nationality					
Chinese	7	19.4%			
Korean	5	13.9			
Philippino	8	22.2			
Peruvian	2	5.6			
Brazilian	2	5.6			
Others	12	33.3			
Japanese					
Daily	20	55.6%			
Babble	7	19.4			
Scarce	5	13.9			
Insurance					
Yes	32	88.9%	110	99.1%	< 0.01
No	3	8.3	0	0.0	
Public assistance	1	2.8	1	0.9	
Length of stay (LOS) (days)	36	7.9 ± 2.6	111	10.4 ± 7.2	< 0.01
Medical cost (1000 yen)	36	227.0 ± 194.6	111	270.0 ± 181.9	0.92

Statistic Analysis: Student's t-test, Chi-square test, and Mann-Whitney's U test.

Results

Characteristics of patients are shown in Table 1. Foreign patients' length of residency in Japan was 8.4 ± 6.6 (mean ± SD) years. Mean age at hospitalization was significantly younger in non-Japanese compared to Japanese (29.8 years vs 32.9 years, *p* = 0.02). There was no significant difference in marital status (*p* = 0.05). The distribution of husbands' nationality was Japanese (44.8%), same nationality (24.1%), different nationality (3.5%), and unknown (27.6%). The distribution of foreign patients' nationality was Chinese (19.4%), Korean (13.9%), Philippino (22.2%), Peruvian (5.6%), Brazilian (5.6%), and others (33.3%). The distribution of Japanese skill was daily (55.6%), babble (19.4%), scarce (13.9%), and unknown (11.1%). Larger proportions of non-Japanese had no insurance compared to Japanese patients (8.3% versus 0.0%, *p* < 0.01). LOS was significantly shorter in non-Japanese compared to Japanese patients (*p* < 0.01).

Comparison of operative method and anesthesia between non-Japanese and Japanese patients is shown in Table 2. There were 147 cases of gynecological surgery analyzed, including cesarean section (*n* = 66), ectopic pregnancy surgery (*n* = 18), ovarian tumor surgery (*n* = 28), hysterectomy (*n* = 16), enucleation (*n* = 6), and others (*n* = 14). Larger proportions of non-Japanese patients were diagnosed with ectopic pregnancy compared to Japanese patients (27.8% vs 7.2%, *p* < 0.01).

Table 2. — Comparison of operative method and anesthesia between non-Japanese and Japanese patients.

	Non-Japanese (n = 36)		Japanese (n = 111)		p
	n	Mean ± SD	n	Mean ± SD	
Operative method					
Cesarean section	12	33.3	54	48.6	< 0.01
Ectopic pregnancy surgery	10	27.8	8	7.2	
Ovarian tumor surgery	5	13.9	22	19.8	
Hysterectomy	2	5.6	14	12.6	
Enucleation	1	2.8	5	4.5	
Others (cone biopsy, etc.)	6	16.7	8	7.2	
Surgery					
Planned	21	58.3	85	76.6	0.02
Emergency	15	41.7	26	23.4	
Anesthesia					
General	6	16.7	9	8.1	0.03
General + epidural	12	33.3	41	36.9	
Spinal	13	36.1	22	19.8	
Epidural + spinal	5	13.9	39	35.1	
ASA-PS					
1-1E	23	63.9	53	47.7	0.09
2-3E	13	36.1	58	52.3	

ASA-PS: The American Society of Anesthesiologists Physical Status.

Statistic Analysis: Student's t-test, Chi-square test, and Mann-Whitney's U test.

Table 3. — Comparison of postoperative events between non-Japanese and Japanese patients.

	Non-Japanese (n = 36)		Japanese (n = 111)		p
	n	Mean ± SD	n	Mean ± SD	
Shower					
Yes	25	69.4	89	80.2	0.18
No	11	30.6	22	19.8	
		Mean ± SD		Mean ± SD	
Use of PCA (times)	36	2.3 ± 2.4	111	2.3 ± 2.6	0.94
Pain control (times)	17	1.8 ± 2.6	82	1.7 ± 1.4	0.26
PCA removal (day)	17	2.8 ± 1.3	75	2.5 ± 0.8	0.55
Urine catheter removal (day)	35	1.1 ± 0.6	111	1.1 ± 0.7	0.46

Statistic Analysis: Student's t-test, Chi-square test, and Mann-Whitney's U test.

The percentage of emergency surgery was significantly higher in non-Japanese compared to Japanese patients (41.7% vs 23.4%, $p = 0.02$), and the proportion of spinal anesthesia was significantly higher in non-Japanese patients (36.1% vs 19.8%, $p = 0.03$), while the proportion of epidural combined anesthesia was lower. The percentage of low (1-1E) ASA-PS tended to be higher in non-Japanese compared to Japanese patients (63.9% vs 47.7%, $p = 0.09$).

Comparison of postoperative events between non-Japanese and Japanese patients is shown in Table 3. Non-Japanese patients tended to refuse to shower during the postoperative period ($p = 0.18$). There was no significant difference in the use of pain control or removal of PCA or urine catheter between non-Japanese and Japanese patients.

Comparison of perioperative data in ectopic pregnancy surgery and cesarean section between non-Japanese and Japanese patients is shown in Table 4. Among ectopic pregnancy cases, the amount of intraoperative blood loss was significantly lower in non-Japanese than in Japanese patients ($p < 0.01$). The percentage of low ASA-PS and laparotomy cases tended to be higher (60.0% vs 25.0%, $p = 0.16$) in non-Japanese compared to Japanese patients.

Moreover, LOS tended to be shorter in non-Japanese than that in Japanese patients (6.5 ± 1.2 days vs 8.0 ± 2.6 days, $p = 0.16$). Among cesarean section cases, the proportion of low ASA-PS tended to be higher (66.7% vs 48.1%, $p = 0.20$) in non-Japanese patients. In addition, the amount of blood loss tended to be lower ($10.2 \pm 4.3 \times 10^2$ g versus $9.3 \pm 6.9 \times 10^2$ g, $p = 0.20$) and Hb level tended to be higher (11.2 ± 1.4 mg/dl vs 10.6 ± 1.3 mg/dl, $p = 0.14$) in non-Japanese patients.

Comparison of perioperative data among four nationalities is shown in Table 5. Among four nationalities including Chinese, Korean, Philippino, and Latin American, certain differences were found in the length of residence in Japan ($p = 0.045$) and LOS ($p < 0.01$) in Latin Americans than that in Chinese, Koreans, or Philipinos. Latin Americans tended to have higher body mass index (BMI) ($p = 0.06$), about four times higher frequency of using pain control ($p = 0.10$), and higher percentage of planned surgeries ($p = 0.16$) compared to other three nationalities. Latin Americans had a higher proportion of high (2-3E) ASA-PS ($p = 0.42$) and Chinese were more likely to refuse to shower ($p = 0.69$) during the postoperative period.

Foreign patients' comprehension of informed consent is shown in Table 6. Among 36 foreign patients, 52.8% (19 patients) could be contacted by phone. Patients contacted were: 36.8% Chinese, 21.1% Philippino, 16.8% Korean, 10.5% Brazilian, and 5.3% Indian, Russian, and Bolivian. Their Japanese language level showed: 63.2% daily, 15.8% babble, and 21.1% scarce. Overall 78.9% of patients contacted understood informed consent from surgical doctors, 73.7% of patients understood explanation in OR, and 84.2% of patients understood explanation provided by anesthesiologists. Almost all patients contacted had some support from family or friends, and about half of patients contacted had the use of an interpreter.

Discussion

This was the first survey reporting ethnic disparities in perioperative management among foreign patients in a hospital in Osaka. This research showed major differences in operative method, emergency surgery, anesthesia, and ASA-PS due to the difference in disease structure, language, and culture. In detail, differences and tendencies were found between non-Japanese and Japanese surgeries such as ectopic pregnancy surgery and cesarean section. At postoperative period, shower frequency tended to differ between non-Japanese and Japanese patients. Moreover, differences were found among four nationalities such as Chinese, Korean, Philippino, and Latin American. During the telephone survey, a large number of patients stated that they had good comprehension of the informed consents and those with Japanese ability were somewhat good to excellent. In other words, it was more difficult for patients that did not speak Japanese.

In overall gynecological patients, foreigners have shown to correlate with multiple factors: age, insurance, LOS, operative method, emergency surgery, anesthesia

Table 4. — Comparison of perioperative data between non-Japanese and Japanese patients who underwent ectopic pregnancy surgery or cesarean section.

	Ectopic pregnancy surgery					Cesarean section				
	Non-Japanese (n = 10)		Japanese (n = 8)		p	Non-Japanese (n = 12)		Japanese (n = 54)		p
	n	%	n	%		n	%	n	%	
Sugery										
Planned	3	30.0	2	25.0	0.62	6	50.0	37	68.5	0.22
Emergency	7	70.0	6	75.0		6	50.0	17	31.5	
ASA-PS										
1-1E	6	60.0	2	25.0	0.16	8	66.7	26	48.1	0.20
2-3E	4	40.0	6	75.0		4	33.3	28	51.9	
Operative approach										
Laparotomy	6	60.0	2	25.0	0.16					
Laparoscopy	4	40.0	6	75.0						
		Mean ± SD		Mean ± SD			Mean ± SD		Mean ± SD	
Blood loss (x10 ² g)	10	3.9 ± 6.3	8	11.6 ± 6.2	< 0.01	12	10.2 ± 4.3	54	9.3 ± 6.9	0.20
Hb (mg/dl)	9	11.4 ± 1.9	8	11.2 ± 1.5	0.86	12	11.2 ± 1.4	53	10.6 ± 1.3	0.14
PLT (104/mm3)	9	28.4 ± 18.5	8	25.2 ± 5.4	0.63	12	25.6 ± 6.3	53	25.4 ± 5.6	0.94
LOS (day)	10	6.5 ± 1.2	8	8.0 ± 2.6	0.16	12	10.1 ± 1.3	54	12.3 ± 8.0	0.42
Pain control (times)	10	1.7 ± 1.9	8	2.6 ± 1.5	0.28	12	3.4 ± 2.7	54	2.7 ± 2.7	0.29

Statistic Analysis: Student's t-test, Welch's t-test, Chi-square test, Fisher's exact test, and Mann-Whitney's U test.

Table 5. — Comparison among four nationalities (Chinese, Korean, Philippino, and Latin American).

	Chinese (n = 7)		Korean (n = 5)		Philippino (n = 8)		Latin American (n = 6)		<i>p</i>
	n	Mean ± SD	n	Mean ± SD	n	Mean ± SD	n	Mean ± SD	
Stay in Japan (yrs)	7	6.3 ± 4.3	3	17.0 ± 8.9	4	11.5 ± 5.7	3	5.3 ± 1.2	0.045
Age (yrs)	7	29.7 ± 4.0	5	32.6 ± 5.5	8	28.5 ± 7.6	6	31.3 ± 13.7	0.53
Blood loss (x10 ² g)	7	4.6 ± 7.5	5	7.1 ± 4.4	8	3.0 ± 4.5	6	5.7 ± 5.0	0.35
BMI (kg/m ²)	7	21.3 ± 4.5	4	20.9 ± 3.5	8	20.9 ± 2.8	5	30.4 ± 9.5	0.06
Hb (mg/dl)	7	11.5 ± 1.7	4	10.6 ± 2.4	8	11.0 ± 1.1	6	12.2 ± 1.6	0.52
PLT (10 ⁴ /mm ³)	6	20.1 ± 5.5	4	24.2 ± 3.0	8	33.3 ± 18.6	6	25.8 ± 4.7	0.13
Pain control (times)	7	1.0 ± 1.2	5	1.4 ± 2.1	8	1.1 ± 1.6	6	4.7 ± 3.1	0.10
Use of PCA (times)	3	0.7 ± 1.2	2	3.5 ± 3.5	5	1.2 ± 1.1	3	4.7 ± 4.6	0.25
PCA removal (day)	6	2.0 ± 1.2	3	3.0 ± 1.0	4	3.0 ± 1.4	3	3.7 ± 1.5	0.46
LOS (day)	7	6.1 ± 2.3	5	6.8 ± 1.3	8	7.6 ± 2.4	6	10.8 ± 1.7	< 0.01
Medical cost (1000 yen)	7	277.1 ± 242.9	5	225.0 ± 258.8	8	244.6 ± 248.8	6	185.3 ± 106.9	0.98
Surgery									
Planned	5	71.4%	1	20.0%	5	62.5%	5	83.3%	0.16
Emergency	2	28.6	4	80.0	3	37.5	1	16.7	
Operative approach									
Non-laparoscopy	5	71.4%	4	80.0%	5	62.5%	6	100.0%	0.41
Laparoscopy	2	28.6	1	20.0	3	37.5	0	0.0	
ASA-PS									
1-1E	5	71.4%	3	60.0%	6	75.0%	2	33.3%	0.42
2-3E	2	28.6	2	40.0	2	25.0	4	66.7	
Shower									
Yes	4	57.1%	4	80.0%	5	62.5%	5	83.3%	0.69
No	3	42.9	1	20.0	3	37.5	1	16.7	

Statistic Analysis: Kruskal-Wallis test, ANOVA, Scheffe's F post hoc test, Chi-square test, and Mann-Whitney's U test.

method, and intraoperative blood loss. Number of foreign patients insisted to be discharged from hospital prior to the recommended date mainly due to the following reasons: did not want to be absent from work, stress due to a language barrier between the patient and medical staff, did not like hospital meals, and so on. The rate of uninsured patients was significantly higher in non-Japanese patients. In particular, 8.3% of foreign patients who had no insurance were put under difficult circumstances or had a weak social status such as: using an insurance card which belonged to a friend, delivering a child whose father was a married man, and so on. Lack of insurance

may affect mortality by several mechanisms because payer status can affect many processes of healthcare [21]. In addition, it was also noted that there was a gap in the knowledge of foreigners regarding the medical insurance system [6], and this resulted in foreign patients without health insurance.

Emergency surgery was strongly associated with the high percentage of ectopic pregnant surgery, the increased use of spinal anesthesia, and decreased use of a combination of epidural and spinal anesthesia, which played a role in ethnic variations in the receipt of the treatments. Nevertheless, foreign patients showed a ten-

Table 6. — *Foreign patients' comprehension and supportive environment.*

Non-Japanese (n = 36)	n	%
Phone survey		
Yes	19	52.8
No	17	47.2
Nationalities n = 19		
Chinese	7	36.8
Philippino	4	21.1
Korean	3	15.8
Brazilian	2	10.5
Indian	1	5.3
Russian	1	5.3
Bolivian	1	5.3
Informed consent from Doctors		
Very good	13	68.4
Good	2	10.5
Not so much	2	10.5
Not at all	0	0.0
Unknown	2	10.5
Explanation in OR		
Very good	13	68.4
Good	1	5.3
Not so much	1	5.3
Not at all	2	10.5
Unknown	2	10.5
Explanation from anesthesiologist		
Very good	14	73.7
Good	2	10.5
Not so much	1	5.3
Not at all	0	0.0
Unknown	2	10.5
Supportive environment		
Family	7	19.4
Friend	7	19.4
Both	11	30.6
Unknown	11	30.6
Interpreter		
Always	4	22.2
Sometimes	7	38.9
Not at all	7	38.9
Unknown	1	5.3

dency to have lower ASA-PS. At postoperative period, non-Japanese patients had lower shower frequency compared to Japanese patients due to cultural differences regarding personal hygiene.

It seemed likely that the data including emergency surgery, anesthesia method, and ASA-PS were affected by the difference in disease structure between non-Japanese and Japanese patients. In order to exclude the effect of disease structure, further analysis was conducted focusing on specific diseases, such as cesarean section and ectopic pregnancy surgery between non-Japanese and Japanese patients. In ectopic pregnancy patients, foreigners' health status/outcome showed to correlate with multiple factors, such as: lower ASA-PS, higher rate of laparotomy, less intraoperative blood loss, and shorter LOS. Successful laparoscopy, being a less invasive procedure, resulted in less pain, faster recovery, and a significantly reduced

length of hospital stay [22]. Interestingly, the results in this study showed lower ASA-PS, less intraoperative blood loss, and shorter LOS among foreign patients with ectopic pregnancy under laparotomy. In reference to the fact that severity of ectopic pregnancy was associated with intraoperative blood loss, it renders generalizations or conclusions difficult. There were some patients who wanted to be discharged within a few days after surgery. These circumstances may possibly be incurred by somewhat insufficient informed consents on laparoscopic surgery performed in foreign patients. Regarding cesarean section, foreign patients' health status/outcome showed to be correlated with several factors: higher rate of emergency surgery and lower ASA-PS.

In this study population, nationalities were associated with length of residence in Japan, pain control frequency, ASA-PS, and shower frequency. Interestingly, it seemed that Latin Americans were more likely to feel pain. However, Japanese nurses often perceived that Latin Americans overreacted to pain, but were actually prone to feel pain. Larger number of Latin Americans had higher ASA-PS and had complications such as electrocardiogram (ECG) abnormality, diabetes mellitus, obesity, and so forth. Chinese were more likely to refuse to shower during the postoperative period compared to Japanese, which showed a good example of a cultural difference in hygiene standards. This may be caused by their cultural background that Chinese do not shower after surgery or delivery.

During the telephone survey, most patients stated that they understood informed consents, explanation in OR, and explanation from anesthesiologists. However, this self-administered telephone survey was doubtful because the ward nurses who administered care to foreign patients attested that they all had difficulties in language (data not shown). In addition, it also seemed likely that those with higher grade of ASA-PS patients such as Latin Americans, were unable to be contacted by telephone. Foreigners from Latin America tended to speak only their native language and were unable to speak neither Japanese nor English. As a consequence, they tended to have wider communication gaps compared to other foreigners. Further approach such as interpreter system and multilingual resources should also overcome language barriers: some aspects which are clarified through another research during the perioperative period.

This study had several potential limitations. First, the proportions of foreigners' nationalities may not be representative of Japan today; second, foreign patients who were thought to have less Japanese ability such as Latin Americans, were difficult to be contacted by telephone; third, a recall bias could have affected the telephone survey results; and fourth, the authors had a limited number of data which made a further factor analysis difficult. However, this retrospective analysis was the first report of a comparison between non-Japanese and Japanese patients undergoing gynecological surgery in Japan. The strength of this study was the two-way approach applied to foreign patients by record review and telephone survey.

In conclusion, the authors have reported the first survey of the ethnic disparities in perioperative management among foreign patients in a certain hospital in Osaka. This research showed major differences in operative method, emergency surgery, anesthesia, and ASA-PS due to the difference in disease structure, language, and culture. In detail, differences and tendencies were found between non-Japanese and Japanese patient surgeries such as ectopic pregnancy surgery and cesarean section. It is recommended that the barriers between non-Japanese patients and medical staff are rectified during perioperative times when mutual understanding is immensely required. Future investigations should include an analysis of larger number of subjects.

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References

- [1] Annual reports of statistics on registration of foreign residents [Web site]. Immigration Office, Ministry of Justice. Available at <http://www.moj.go.jp/PRESS/090710-1/090710-1.html>. Accessed on January 15, 2010.
- [2] Murphy-Shigematsu S.: "Cultural psychiatry and minority identities in Japan: A constructivist narrative approach to therapy". *Psychiatry*, 2000, 63, 371.
- [3] Noda E.: "Mental health issues affection ethnic minorities in Japan". *Psychiatry Clin. Neurosci.*, 1998, 52 (suppl.), S367.
- [4] Andresen J.F.: "Cultural competence and health care: Japanese, Korean, and Indian patients in the United States". *J. Cult. Divers.*, 2001, 8, 109.
- [5] Bebout L., Arthur B.: "Cross-cultural attitudes toward speech disorders". *J. Speech Hear. Res.*, 1992, 35, 45.
- [6] Hotta M., Ali M., Ushijima H., Lee S., Nakamura Y., Shigeta M., Kobayashi N.: "Situational analysis of maternal and child health services for foreign residents in Japan". *Pediat. Int.*, 2007, 49, 293.
- [7] Clapp B., Jarmillo M., Vigil V., Macias L., Bouton M., Gallardo C., Kassir A.: "Patient comprehension and recall of laparoscopic surgery and outcomes in a non-English speaking population". *JSLLS*, 2007, 11, 242.
- [8] Pradhan J., Schreiber T.L., Niraj A., Veeranna V., Ramesh K., Saigh L., Afonso L.: "Comparison of five-year outcomes in African-American versus Caucasians following percutaneous coronary intervention". *Catheteriz. cardiovascul. intervent.*, 2007, 69, S75.
- [9] Morrissey N.J., Giacovelli J., Egorova N., Gelijns A., Moskowitz A., McKinsey J. *et al.*: "Disparities in the treatment and outcomes of vascular disease in Hispanic patients". *J. Vasc. Surg.*, 2007, 46, 971.
- [10] Hawley S.T., Fagerlin A., Janz N.K., Katz S.J.: "Racial/ethnic disparities in knowledge about risks and benefits of breast cancer treatment". *Health Serv. Res.*, 2007, 43, 1366.
- [11] Du X.L., Sun C.C., Milam M.R., Bodurka D.C., Fang S.: "Ethnic differences in socioeconomic status, diagnosis, treatment, and survival among older women with epithelial ovarian cancer". *Int. J. Gynecol. Cancer*, 2007, 18, 660.
- [12] Zell J.A., Rhee J.M., Ziogas A., Lipkin M., Culver H.A.: "Race, socioeconomic status, treatment, and survival time among pancreatic cancer cases in California". *Cancer Epidemiol. Biomarkers Prev.*, 2007, 16, 546.
- [13] Reddan D.N., Szczech L.A., Klassen P.S., Owen W.F.: "Racial inequity in America's ESRD program". *Semin. Dial.*, 2000, 13, 399.
- [14] Ramsey D.J., Goff D.C., Wear M.L., Labarthe D.R., Nichaman M.Z.: "Sex and ethnic differences in use of myocardial revascularization procedures in Mexican Americans and non-Hispanic whites: the Corpus Christy Heart Project". *J. Clin. Epidemiol.*, 1997, 50, 603.
- [15] Ibrahim S.A., Siminoff L.A., Burant C.J., Kwok C.K.: "Understanding ethnic differences in the utilization of joint replacement for osteoarthritis: the role of patient-level factors". *Med. Care*, 2002, 40, 144.
- [16] Giacomoni M.K.: "Gender and ethnic differences in hospital-based procedure utilization in California". *Arch. Intern. Med.*, 1996, 156, 1217.
- [17] Andrews R.M., Elixhauser A.: "Use of major therapeutic procedures: are Hispanics treated differently than non-Hispanic Whites". *Ethn. Dis.*, 2000, 10, 384.
- [18] Disparities in screening for and awareness of high blood cholesterol-United States, 1999-2002. *MMWR Morb. Mortal. Wkly. Rep.* 2005, 54, 117.
- [19] Hapsari E.D., Azuma E., Matsuo H.: "Overcoming language barriers of a Peruvian woman who received myomectomy: a case report". *Bulletin of Health Sciences Kobe*, 2004, 20, 37.
- [20] Maeno M., Kamada H., Sakuyama M., Yoshimi K., Motoyama S., Matsuo H.: "Brazilian woman who underwent cesarean section in Japan - How to overcome complications, communication gap, and cultural/medical differences in perception". *Bulletin of Health Sciences Kobe*, 2009, 25, 61.
- [21] Rosen H., Salch F., Lipsitz S., Rogers S.O., Gawande A.A.: "The accidental cost of being uninsured". *Arch. Surg.*, 2009, 144, 1006.
- [22] Walker J.L., Piedmonte M.R., Spirtos N.M. *et al.*: "Laparoscopy compared with laparotomy for comprehensive surgical staging of uterine cancer: gynecologic oncology group study LAP2". *J. Clin. Oncol.*, 2009, 27, 5331.

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