The Medical Tourism in Japan: Focusing on the Analysis of Medical Resources by Mixed Effect Model

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Abstract

【Objective】 In Japan, medical tourism is promoted in the form of "international medical exchanges (acceptance of foreign patients)" by priority project of "New growth strategy 2011". There is also an opinion that medical tourism is used as an initiator of medical revitalization in the local areas, and there are areas that were already applied for medical special zones. In rural hospitals, the objectives such as "securing the number of patients", "improving the availability factor of facilities", and "accumulating cases for treatment, equipment and medicine development ", "improving internationalization and creating related employment" are listed. Medical tourism is said to be a breakthrough measure for regional medical revitalization, but there remains a question as to whether the data analysis is cleared. Therefore, in this research, we examined whether medical tourism could be a countermeasure based on the current state analysis of local medical care. 【Method】 Based on the facility survey data of 2011 and the data of the elderly population in 2011, the analysis is made on the number of doctors, installation rate of CT and MRI and the elderly population in both metropolitan areas and rural areas with using a mixed effect model. And we examined the relationship between the excess of medical facilities and the possibility of use in medical tourism. SPSSVer.21 is used for statistical analysis. 【Results】 As for the number of physicians, there was a significant difference between metropolitan areas and rural areas. Regarding medical facilities, however, it was not necessarily said that CT and MRI were installed significantly in only certain areas among regions. 【Discussion】 Although medical tourism is one of the growth industries and there is a risk of missing the wave of internationalization of medical treatment, it is doubtful whether there is a necessity to reform the current medical system and to liberalize medical market.

Keyword ——— medical tourism, number of CT/MRI, regional medical revitalization, population of aged people

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Background:

The trend of the global mobility of the patients seeking of better medicine is expanding, especially in the couple of Asian countries nowadays. Key factors associated with the rise in the global movement of patients across international borders include the growing globalization and inter-connectedness of economic production and trade, new forms of political cooperation, technological developments, and a burgeoning international market in medical care and services provided by health professionals[1) 2) 3)].

In Japan, the government presses forward with comprehensive measures for medical tourism in 2009, which was approved by the cabinet decision[4)]. In 2011, the decision was amended partially to use "international medical exchange" not using the term medical tourism to avoid the confusion in thinking about medicine with some business images[5)].

At the beginning, as for medical tourism, there are dichotomic pragmatic meanings, one is in-bound medical tourism and the other is out-bound medical tourism, we focus solely on in-bound medical tourism in this paper. The concept of medical tourism includes, large number of people traveling for treatment with low cost flights, the rapid expansion of the internet as a main source of information, development in this area both in private and public sector and government involvement in promoting medical tourism, considering it as a profitable revenue source.

As for the medical tourism, there is no agreed definition but it is defined as the "deliberate movements across international borders of patients seeking of planned health care" from one point of view[6)] and is also defined a medical tourism as when consumers elect to travel across international borders with the

intention of receiving some form of the medical treatment. This treatment may span the full range of medical services, but most commonly includes dental care, cosmetic surgery, elective surgery, and fertility treatment[5]. It takes a variety of forms, ranging from international healthcare service agreements, people living in the border areas, who are temporal visitors abroad, expatriates and immigrants seeking of healthcare abroad. The wealthier patients seek the best care available or the middle-class socioeconomic groups traveling out of country for the lower-costs health care services than they may have to pay for private services in their country of origin. One of the most expected medical services in Japan is health check-up. Because most of the hospital settings, even in local areas, are well-equipped with good quality of medical facilities, conspicuously high ratio per capita, which is shown in the WHO statistics in 20157). And there are some comments that medical tourism makes a bailout plan for most of the hospital settings in localities, where the population is decreasing, to make good use of their excessive medical resources for foreign patients.

Method:

The data source for the present study was the healthcare facilities survey in 2013 in Japan. The MDCTs (multi-detector CTs) ratio (%) was defined as the number of MDCTs divided by the number of the patient who use the MDCTs. To account for correlations within prefectures or regions, we utilized PROC MIXED in SAS. The MDCTs patients weighted MDCTs ratio in each prefecture was estimated by a mixed-effects model and adjusted by the number of physician and the estimated elderly population growth rate in 2020 to that of 2010. The random effects were intercept and 47 prefectures or 8 regions.

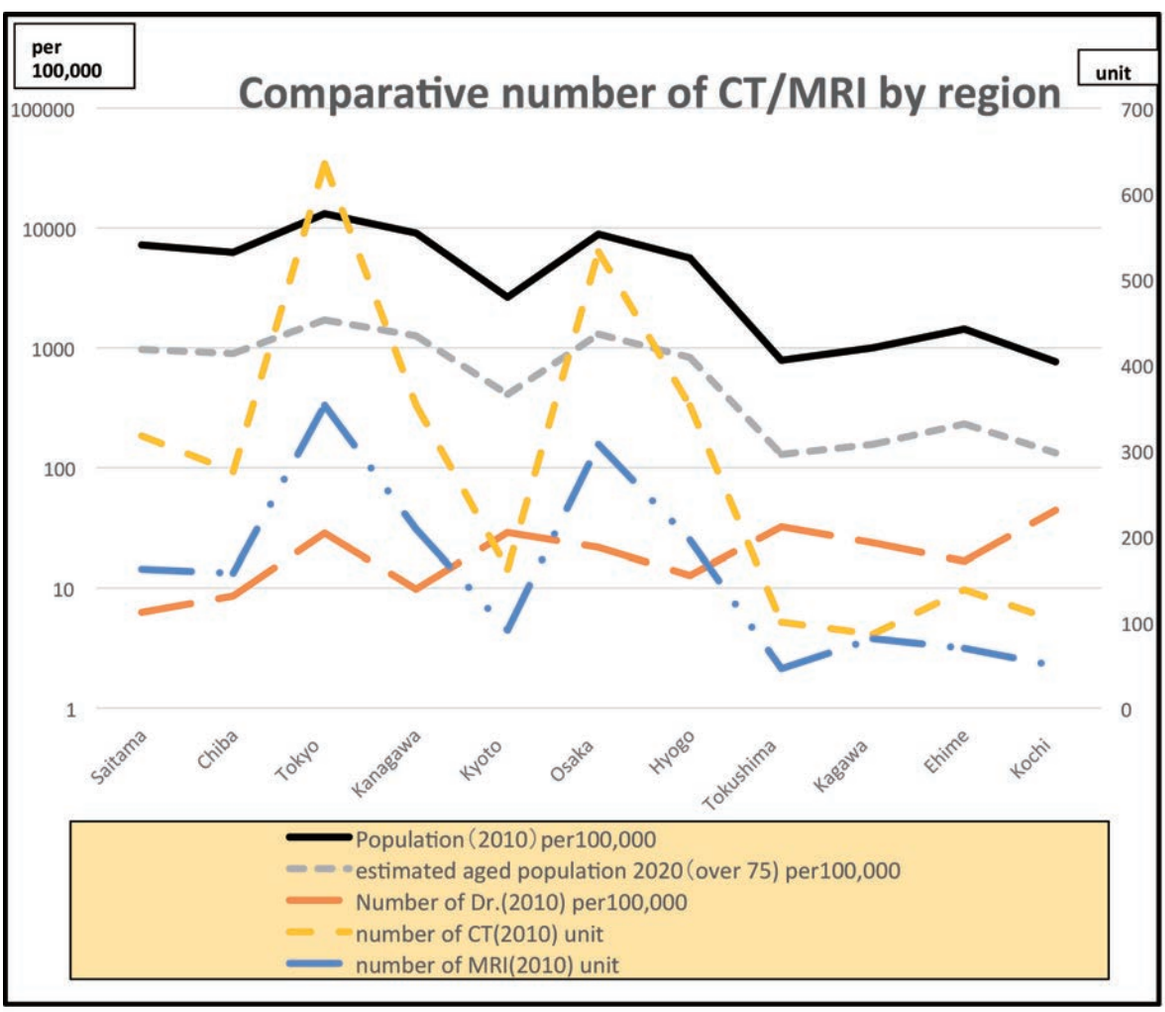

Fig. 1 Comparative number of total MDCT/MRI by the region

Result:

The advanced health check medical devices and equipment in this paper refer to the total number of, so-called, MRI (Tesla less than 1.5) and high-tech MRI (Tesla 1.5 or more), and in case of MDCTs, the total number of MDCTs (multi-detector CTs) and SDCTs (single-detector CTs) was the subject of this research and analysis. As is shown in the Fig. 1, the simple comparison by the region shows the clear correlation in the ratio of medical devices for physical checkup per population. However, the disproportionate number of the physicians is clear and shows the imbalance"Seiko－Totei"(Lower in the eastern and Higher in the western) . Fixing the number of MDCTs in 2010 and applying it to the elderly population with estimated values 2025 tends to increase the ratio of MDCTs to the elderly population. (Fig. 2).

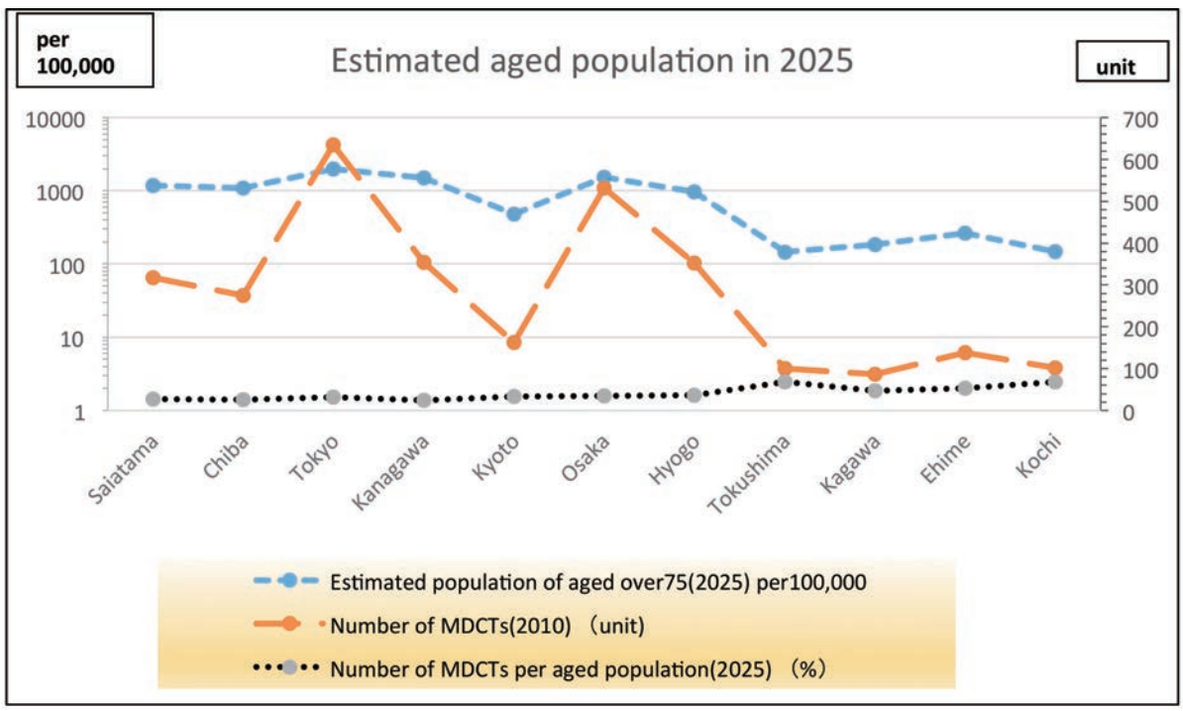

Fig. 2 Estimated aged population in 2025

In all prefectures, as a result of analyzing the MDCTs ratio only by the estimation on a mixed-effects model, between 3 areas with large cities such as Kanto, Kansai, Chubu and the local area, such as Shikoku, there are differences in MDCTs ratio and population. However, the difference is not particularly so large in the Shikoku area, but the Kyushu area is somewhat larger (Fig.3)

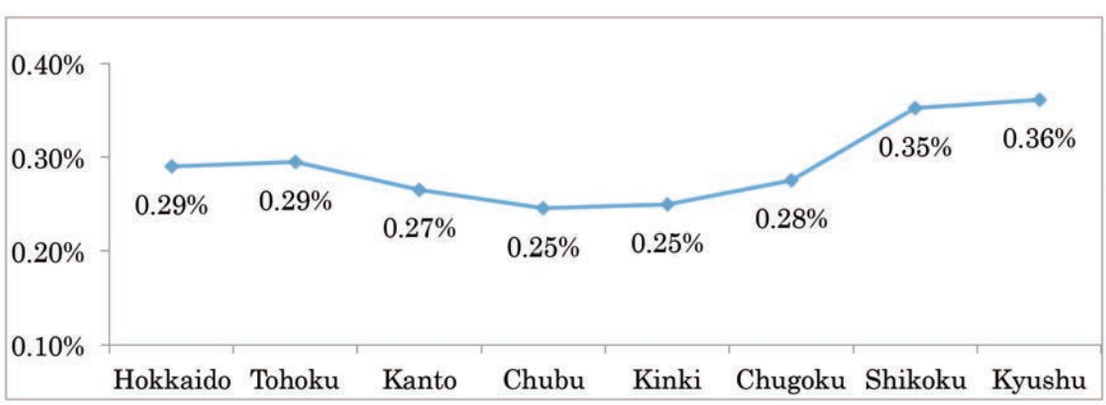

Fig.3. Ratio of MDCT / MDCT patients (by area)

Based on the actual numbers over 65 years old, calculated the predicted value of the aged population growth rate in 2020 against 2010 and incorporated it into the model as an adjustment variable, there is a difference between the urban area and the local area, but between the local areas each, there is no significant difference. (Fig.4)

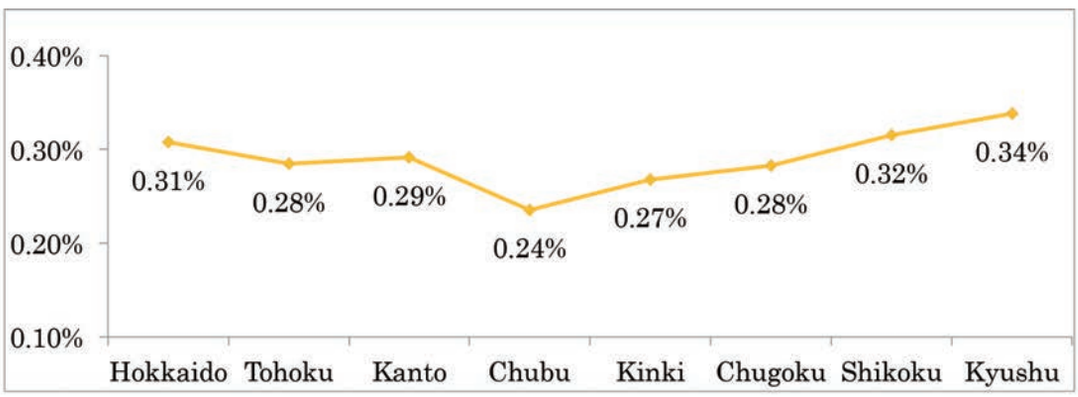

Fig.4. Number of MDCT / MDCT patients (Mixed effect model by region weighted by number of MDCT patients in each prefecture, adjusted with the number of physicians and population growth rate 2010-2020)

Discussion:

Pros and cons:

There is a big debate to polarize opinion on medical tourism. One of the leading groups of dissentients is JMA (Japanese Medical Association). In the survey of 2010, about 70% was against the medical tourism and the main reason is that medical tourism might lead the collapse of the universal health insurance system in Japan and more[8]. In addition, they insisted that the government should prioritize another support such as the regeneration of medical services in localities where the medical supply is not enough to the people living[9].

On the other hand, there must be another discussion, that is, the medical devices are more excessive per capita in the local areas, such as called Shikoku island (means four countries = Tokushima, Kagawa, Ehime and Kochi) than in big cities, such as Tokyo or Osaka because of the depopulation of those local areas. Therefore, the medical tourism makes the supportive countermeasures for hospital settings located at those local areas, which have some trouble on excessive high cost on medical devices[10]. However, this is totally antinomy between two discussions, in this paper we try to elucidate if the medical tourism will be the savior to the hospital settings in the local areas. For the first step, we have surveyed on the surplus number of medical devices, such as multi-detector CTs (MDCTs) and MRIs in the local hospital settings and for the second stage, we have conducted the statistical analysis of comparison on medical resources between the big cities and the local area about the number of medical devices per capita in this paper.

When comparing medical devices for health check, such as MRIs and MDCTs simply by population ratio, it seems as though there seems to be an extra margin in its numbers in local areas, such as Shikoku, but with the estimation of population increase of elderly people, using a mixed-effects model, it cannot be said that there is a big difference in the holding ratio of medical devices. In some regions, such as Shikoku and other places, there is a special plan of so-called “Tokku (means specific district in Japanese) “to promote medical tourism by using excessive medical devices. However, in comparison with the other local areas, such as Kyushu and Hokkaido, it is not clear that its holding ratio is particularly high. We found out that promoting the turnover rate of the dormant medical devices may not be a direct good reason for carrying out the medical tourism. The promotion of medical tourism in Japan should be considered only as a tourism strategy but exclusive of healthcare matter in the local areas.

Conclusion

The possibility of medical tourism in Japan is not small. But the problem is that the business model is not clear. Do not forget the mission to respond to customer needs (here patients) in any business. After finishing the screening, where in the world is medical treatment "Cancer was found in the exam re-

sult, then return?" If you are a doctor, are not you guilty about not including consultation including treatment for patients? With healthcare services with only medical checkups, you cannot help thinking halfway as a business model. Although it is medical tourism, it should not deviate from the essence and mission of medical care. Even in medical tourism, medical services themselves are of universality, which comes from the nature that they originally have global nature, which is obvious. However, the health system itself is not global. The problem should be discussed on how to match with the medical system owned by each country. First of all, medical tourism must be considered on the premise that it exists as a fact, but running away cheap is not a good idea. It is time to think back to the origin to see what medical treatment is for and for whom. Medical tourism includes such fundamental propositions.

Limitation of the research:

In this analysis, we do not consider the actual turnover rate of medical devices at each medical setting. And also, it is only comparison of the number of medical devices, so it does not include any calculated depreciation on the general accounting principle.

Reference

1) Neil Lunt,Russell Mannion : Patient mobility in the global marketplace: a multidisciplinary perspective, Int J Health Policy Management 2014, 2(4), 155–157
2) Signe Smith Nielsen et al :Use of cross-border healthcare services among ethnic Danes, Turkish immigrants and Turkish descendants in Denmark: a combined survey and registry study, BMC Health Services Research 2012, 12:390
3) Johanna Hanefeld et al : What Do We Know About Medical Tourism? A Review of the Literature With Discussion of Its Implications for the UK National Health Service as an Example of a Public Health Care System, Journal of Travel Medicine 2014; Volume 21 (Issue 6): 410–417
4) Cabinet Council Decision2009“Shin Seichou Senryaku (Kihon Hoshin ni tsuite)”: Dec.30, 2009
5) Cabinet Council Decision2011”Shin Seichou Senryaku Jitugen 2011”:Nov.25,2011
6) Neil Lunt, Richard Smith, Mark Exworthy, Stephen T. Green, Daniel Horsfall and Russell Mannion :Medical Tourism : Treatments, Markets and Health System Implications: A scoping review OECD publication services 2010
7) World Health Statistics 2015 Part II, Global Health Indicator 6.Health Systems, p112-p123
8) The trend of Medical Tourism in each prefecture in Japan, from the regular press conference 2011, JMA
9) Akik Ikuo Mitani : The present situation of medical tourism and its future debate in Japan, Satui Tsushin 2011 No.525 p26-p30
10) Akiko Ito : Globalization of medicine in Japan-over the acceptance of medical travelers, “Gijutu to Bunka ni yoru Nihon no saisei” ,General Report 2012-09 p109-p114

日本における医療観光展開の可能性
―混合効果モデルを用いた医療資源分析からの視点より―

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要旨

【目的】日本の医療ツーリズムは、「新成長戦略2011」の重点プロジェクトにより「国際医療交流（外国人患者の受け入れ）」という形で進められることとなった．また医療ツーリズムを地域での医療再生の起爆剤に用いるといった声があり，すでに医療特区申請もされた地域がある．地方の病院では「患者数確保」、「設備の稼働率向上」、「治療法、機器･医薬開発のため症例蓄積」、「国際性向上」「関連雇用の創出」といった目的を掲げている．医療ツーリズムが地方医療再生の打開策と言われるが、データの分析の裏付けがなされているのか疑問が残る．そこで本研究では、地方医療の現状分析を踏まえた上で、医療ツーリズムが対策となりうるかを検証した．【方法】2011年の設備調査データと2011年の高齢者人口のデータを基に、大都市圏と地方の医師数、CTとMRIの設置率と高齢者人口について、混合効果モデルを用いて分析を行い、医療設備の過剰度と医療観光における利用の可能性との関係を調べた．統計分析にSPSSVer.21を用いた．【結果】医師数に関しては、大都市圏と地方では有意に差が認められた．しかし医療設備に関しては、地方相互間においては、必ずしも特定の地域だけに有意にCTやMRIの設置台数が多いとは言えなかった．【考察】医療ツーリズムは成長産業の１つであり、医療の国際化の波に乗り遅れる恐れもあるが、現在の医療制度を改革してまで医療市場の自由化に向ける必要性があるか疑問である．

キーワード

医療ツーリズム、CT/MRI 設置台数、地方医療再生、高齢者人口