

Original

The history of Traube's stethoscope in Japan, America and Europe through literatures and photographs, and research into the spiritual bonds between midwives and mothers

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Abstract

[Purpose] In this study, we examined the history of Traube (tubular stethoscope), which has been used by maternity nurses since the 1800's for the diagnosis and practice of midwifery. In addition, we determined the contemporary significance of the bond between maternity nurses and pregnant women through Traube, based on the literature on midwifery in which maternity nurses provided support to pregnant women using this medical instrument. [Method] The analysis was based on historical data related to midwifery. The primary and secondary parameters were identified by consulting the Japan Medical Abstracts Society website and library book storerooms and by searching and extracting relevant books from the libraries of medical departments at historical universities and the National Diet Library in Japan. [Result] The data collected from the 1800's to 2000's were divided into three areas: age, region, and contents of description. We prepared chronological tables on the history and photographs of Traube in Japan, America, and Europe, using data extracted over a period of time. The data describing the use of Traube to listen to fetal heart tones in pregnant women was divided into two areas, i. e., description and age, to prepare a historical chronological table. [Discussion] During the postmodern age, birth delivery at home or in residential regions was the origin of manual midwifery. Maternity nurses encouraged pregnant women using their hands, eyes, ears, and mind, based on the five senses. This practice has been preserved over the years through the diagnosis and practice of midwifery by listening to the fetal heart tones using Traube. Maternity nurses deepened their love for pregnant women and their unborn child using the warmth of their hands and Traube and in combination with their mind.

Key words : History of Traube's Stethoscope, Japan, America and Europe, Spiritual Bonds, Midwives History of Literature and Photographs, Midwives and Mothers

I. Introduction

By using the Traubestethoscope to get close to the mother and child, the midwives encouraged the mothers, and utilized their hands-on midwifery using their five senses, with their own hands, ears, eyes and heart, and we believe that their spirits, knowledge and skills were cultivated as they practiced midwifery, while listening to the fetal heartbeat using the Traubestethoscope. 1955 was a turning point, where the introduction of ME equipment began, with hospital childbirth under doctors, and this also included high-tech diagnos-

tic techniques, however it could also be said that at the same time, midwife diagnostic techniques using the Traubestethoscope were neglected.

The purpose was to focus on a historical comparison of Traube's stethoscope in the 3 areas of Japan, America and Europe, where it was used to listen to the fetal heartbeat, divided into eras from the 1800s to the 2000s, as well as descriptions in literature related to midwifery where Japanese midwives supported mothers using this medical tool, and to gain new knowledge from midwife history by focusing on the spiritual bonds between midwives and mothers.

II. Methods

1. Time Periods and Locations for Collecting Data
 - 1) 3-10.2006 Kagawa University Library Faculty of Medicine Branch 'Igaku Chuo Zasshi'
 - 2) 3-8.2006 Nagasaki University Medical Library, University of Tokyo Medical Library, Juntendo University Medical Library, Osaka University Medical Library, Internet
 - 3) 7-8.2006 National Diet Library, Instrument Manufacturing Plant
 - 4) 8-10.2006 Japanese Midwives Association Kagawa Prefecture Branch
2. Methods for Collecting Data
 - 1) Document retrieval at 'Igaku Chuo Zasshi' at affiliated university, targeting all periods using keywords (Traube's stethoscope, history, fetal heartbeat, midwife, maternity nurse)
 - 2) Extraction and datafication of articles related to this research through browsing library archives at the affiliated university and all universities
 - 3) Searching and datafication via the internet
 - 4) Searching and datafication of copies from microfilms related to this research at the National Diet Library
 - 5) Searching and datafication of the Instrument Manufacturing Plant
 - 6) Searching and datafication of photos owned by midwives
3. Analysis Target: gathering historical primary sources and secondary sources related to midwifery where possible from the 1800s to the 2000s.
 - 1) 26 historical records of Traube's stethoscope (20 photographs): Table 1
 - 2) 25 documents where Traube's stethoscope was used to support mothers: Table 2
4. Terminology Definitions
 - 1) Pre-modern Traube: in this research, this refers to the low-tech era where midwives used Traube's stethoscopes with home birth or midwife home as the childbirth location.
 - 2) Present Day Traube: in this research, this refers to the era with a change from Traube's stethoscope to childbirth monitors, where high-tech medical apparatus were used, with the midwife home or

- hospital birth as the childbirth location (a transitional period to hospital birth).
- 3) Post-modern Traube: in this research, this refers to the era where the Traube's stethoscope is used instead of evolved high-tech medical equipment, with the hospital birth, midwife home, or in-house maternity center as the childbirth location (a return to pre-modern); this is an era where feelings of satisfaction and decision-making that suit individual desires are respected, and where midwives get close to mothers for the physiological phenomena of birth, and support them with their own warmth.
5. Analysis Method
 - 1) Preparation of a collected list of photographs, document count and document names related to midwifery and the history of Traube's obstetric stethoscope
 - 2) Preparation of table of literature where Traube's stethoscope was used to support mothers, from seven types of journals related to midwifery from 1896-2006
 - 3) For the analysis framework, preparation of a historical comparison chart for the three regions of Japan, America and Europe, with the eras divided into three categories (stage 1: pre-modern, stage 2: modern, stage 3: post-modern) that focus on the diffusion process of Traube's stethoscope and the childbirth location in Japan, using documents related to Traube's stethoscope being used by midwives to support mothers in Japan
 - 4) For the analysis framework, preparation of a historical comparison chart using photographs for the three regions of Japan, America and Europe, with the eras divided into three categories (stage 1: pre-modern, stage 2: modern, stage 3: post-modern) that focus on the diffusion process of Traube's stethoscope and the childbirth location in Japan, using documents related to Traube's stethoscope being used by midwives to support mothers in Japan
 - 5) Preparation of a description summary related to the eras categorized as the three Traube eras and the support of mothers by midwives using Traube's stethoscope in Japan, and a description literature summary prepared with keywords
- Research Purpose

III. Result

When collecting data, we searched the 'Igaku Chuo Zasshi' web using keywords but could not view the data, so for midwife documents using Traube's stethoscope to support mothers, we searched manually at Kagawa University Library, focusing on journals related to midwifery, and

sorted each journal into one of seven types.

With the collected list of photographs, document count and document names related to midwifery and the history of the obstetric stethoscope (Traube) (table 1), we were able to extract 27 documents and 20 photographs. From the list of literature related to midwifery that used the Traubestethoscope to support mothers, which

Table 1 Collected list of photographs, document count and document names related to midwifery and the history of the obstetric stethoscope (Traube's)

	Number	Photo of Traube's	Author, title, publisher, vol, issue date
Nagasaki University	2	1	<ul style="list-style-type: none"> • Masakiyo Ogata: Japanese Obstetrics History: Marzen, 1915. • Toshiro Ohmura: Home of Stethoscope and jector.Koukodo, 1988.
Tokyo University	1	0	<ul style="list-style-type: none"> • Sanba no tomo: 1(15)
Osaka University	2	2	<ul style="list-style-type: none"> • Centennial of Osaka University Midwife Education: Osaka University Midwife Education Centennial commemoration Editorial commission, 24, 1980. • Osaka University Midwife School Closing commemoration number: Osaka University Midwife School Closing commemoration Editorial committee, 79, 1997.
Kagawa University	9	3	<ul style="list-style-type: none"> • Masakiyo Ogata: Josann no Shiori, No306, 1922. • Hajime Muneta: Japanese Medical Culture History, Shibunkaku, 1989. • Shungo Ohsato: Internal Diagnosi, Nanzando, 1935. • Magaret Myles: Myles'Manual for Midwife, Trans; Seiichi Matsumoto, Medical View, 1978. • Naoharu Fujii: World Medical Chronological Science Journal, 1980. • Shoichi Ando: Midwifery, 1, Houmeido, 1924. • Japanese Medical History Compilation: Sanichi Shobou, 1978. • Midwife: Japanese Midwives' Association, No. 53 • Yasuko Aoki: Mother-Child Health, book 1, Midwifery, JNA, 1972.
National Diet Libray	1	1	<ul style="list-style-type: none"> • Internal Manual and Science Diagnosis: Trans; Yoshinao Kobayashi, 1875.
Website/book	10	7	<ul style="list-style-type: none"> • http://en.wikipedia.org/wiki/Loudwing_Traube%28physicia%292006.6.14. • http://www.antiquemed.com/monaural_stethoscope.htm2006.6.14. • M. Donald Blaufox: An Illustrated History of The Evolution of the Stethoscope, Pathenon Publishing Group, 65, 136-137, 2002. • Brigitte Jordan: Birth in Four Cultures, Webeland Press, Inc, 2001. • Mugiko Nishikawa: A story of one modern midwife, 168, Katsura Shobo, 2004. • Takashi Okai: Thinking on Fetal heart Monitoring, JSOG journal, 58(9), N-481, 2004. • Marden Wagner: The search for appropriate birth technology, 179, Medica, 2002. • WHO · Care in Nomal Birth: a practice guide, AFCA Publ, 1997. • Akiko Ohno: Good-by Delivery Bed, 154, Medica Publ, 1999. • Michiko Ohbayashi: Delivery-woman and Man, Keis-shibou, 1994.
Artifact factory	1	0	<ul style="list-style-type: none"> • MIC, Medical Artifact Standard Catalogue, TMAA, 322, 1961
Kagawa University Tokushima University Tokyo University of Library JMA. Kagawa branch	0	6	<ul style="list-style-type: none"> • Naoko Naitoh: The photograph of Kagawa University of Maternal and Nursing course practice, 2003. • Mitsuko Sasaki, Naoko Naitoh: A Support Program for Characteristic University Project PBL and Tutorial Education on Nursing: Mitsuko Mori Report of FD training meeting, Mitsuko Mori of Japan Red Cross Musashino College PBL Education Practice on Maternal, 2005. • Naoko Naitoh, et al: Logomark of Tr's aubestethoscope printed on the envelope of Osaka University Midwife School, 1998. • Mieko Takeuchi: A photo of the obsteric stethoscope at a birthing clinic in Amstrdam, Midwife Journal, 12(11), Medical view, 1958. • Sathie Sogh, Kazuyo Ikezoe: A photo of the obsteric stethoscope as a souvenior of JCM in Norway, 2004.
Total	26	20	

Not found by using keywords on Medical Journal Web site.Sources on midwives who utilized Traube's stethoscope for maternal assist were searched at Kagawa University Library, classified journals by seven

Table 2 Table of literature where Traube's stethoscope was used to support mothers, from journals related to midwifery from 1896-2006

title-publisher	date	number of copys	number of Traube's descriptions
Josann no Shiori Ogata Midwife School	1896~1931	331	6
Study of Midwifery Gendai no Igakusha	1927~1935	38	0
Health and Midwifery Health and Midwife soc	1947~1957	87	1
Midwife JMA Journal	1958~2002	293	0
Midwife JMA publisher	2002~2006	41	2
Midwife Journal Medical View	1960~2002	227	13
Midwifery Medical View	2003~2006	58	3
Total		1075	25

(Kagawa University Library)

was taken from the seven types of journals related to midwifery from 1896-2006 (table 2), we were able to extract descriptions of midwifery that used the Traubestethoscope from 25 documents out of the 1075 journal volumes related to midwifery. From this literature, we were able to study the three categories of Traubeeras, focusing on the diffusion process of the Traubestethoscope, and the childbirth location for Japan's history of childbirth. We defined the period from 1819 to 1954 as pre-modern, and named the childbirth location of home birth or midwife home as stage 1 (table 6); we defined the period from 1955 to 1996 as modern, and named the childbirth location of midwife home or hospital birth as stage 2 (table 7); and we defined the period from 1997 to 2006 as post-modern, and named the hospital birth, midwife home or in-house maternity center as stage 3 (table 8). From the above, we considered the analysis framework for this research, and analyzed the history of the three regions of Japan, America and Europe (table 3, after which we created historical tables and photographic historical tables of the Traubestethoscope, as well as description literature lists (table 4, table 5) related to support of mothers by midwives, and through this the viewpoint emerged that it was possible to observe "spiritual bonds" between the midwives and mothers.

IV. Discussion

1. With the collected list of photographs, document count and document names related to midwifery and the history of the obstetric stethoscope

(Traube) (table 1), we were able to extract 27 documents and 20 photographs. From the list of literature related to midwifery that used the Traubestethoscope to support mothers, which was taken from the seven types of journals related to midwifery from 1896-2006 (table 2), we were able to extract descriptions of midwifery that used the Traubestethoscope from 25 documents out of the 1075 journal volumes related to midwifery. From this literature, we were able to study the three categories of Traubeeras, focusing on the diffusion process of the Traubestethoscope, and the childbirth location for Japan's history of childbirth. We defined the period from 1819 to 1954 as pre-modern, and named the childbirth location of home birth or midwife home as stage 1; we defined the period from 1955 to 1996 as modern, and named the childbirth location of midwife home or hospital birth as stage 2; and we defined the period from 1997 to 2006 as post-modern, and named the hospital birth, midwife home or in-house maternity center as stage 3. From the above, we considered the analysis framework for this research, and analyzed the history of the three regions of Japan, America and Europe, after which we created historical tables and photographic historical tables of the Traubestethoscope, as well as description literature lists related to support of mothers by midwives, and through this the viewpoint emerged that it was possible to observe "spiritual bonds" between the midwives and mothers.

2. With the study of the diffusion process of the Traubestethoscope, the three categories of eras

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Table 3 History of Japan, America and Europe with the eras divided into three categories focusing on the diffusion process of Traube's stethoscope and childbirth location in Japan

Place	Traube's pre-modern 1819~1954										Traube's modern 1955~1996				Traube's post modern 1997~2006	
	stage 1 Home birth Birthing clinic 1819~1954										stage 2 Birthing clinic Hospital 1955~1996				stage 3 Hospital Birthing Center in	
Jap	1819	1821	1824	1848	1850	1855	1876	1912	1924	1934	1936	1958	1961	1972	1997	2006
	The stethoscope were imported from Paris were sold with Laennec's books for two francs 1820	J. A. Lejumeau (Kergaradec) first used Laennec's stethoscope in obstetrics. At that time he noted the double pulsation caused by the fetal and maternal heartbeats.	John Bell used the stethoscope first.	Mohrlike brought the stethoscope to Japan	Seikyo Sugita translated the manuals of stethoscope and reported in the journal "Saisei Bikou"	P. Cammn invented first practical binaural stethoscope	A. Pinnard, Pajet, Depaul modified the stethoscope for obstetric use, shorter tube and wide bell end.	1912 Traube's stethoscopes were listed in the Kny-Scheerer Co. catalog.	How to use a stethoscope and a binaural stethoscope was mentioned in the Midwifery Vol. 1	Traube's stethoscope was used for maternal examination at Osaka University, School for Midwife.	Aono medical equipment firm put a Traube's stethoscope on a catalog for 100 yen or less, 60 sen	Tokyo Iwashiyama Co. Itoh & Co. sold Traube's stethoscope for 130 yen.	Traube's stethoscope modified by the name of Kinoshita, Higuchi, Sakaki, and Keiou were mentioned as the stethoscopes for obstetric in the Medical Equipment for Obstetrics and Gynecology.	1972 Four kinds of modified Traube's stethoscope were mentioned in the Mother Child Health Manual.	1997 The memorial monument was set up at Osaka University Midwife School for the evidences of inheritance of 121 years history	2006 Traube's stethoscope has been applying for practicing at the Maternal Nursing Course at Kagawa University.
USA																
Eur	1819	1821	1826	1838	1850	1863									2002	2006
	The stethoscope were imported from Paris were sold with Laennec's books for two francs 1820	J. A. Lejumeau (Kergaradec) first used Laennec's stethoscope in obstetrics. At that time he noted the double pulsation caused by the fetal and maternal heartbeats.	R. Laennec expanded and modified his original stethoscope	David C. Nagle reported on uses "cylinder" in obstetrics and identified twins. He also noted the value of the placental souffle.	Ludwig Traube in Germany improved Laennec's stethoscope.	Eight kinds of stethoscopes got into Weiss catalogue.			1916 The Hills DeLee obstetric stethoscope to hear the fetal heart during the last part of the second stage of labor was introduced.					2002 A obstetric stethoscope was given as a memorial of ICM	2006 Three stethoscopes were used at a clinic in	

Table 4 A historical comparison via photographs of Japan, America and Europe, sorted into three eras, focusing on the diffusion process of the Traube's stethoscope and childbirth locations in Japan

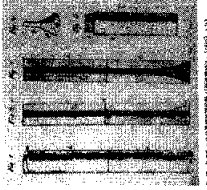
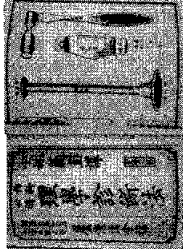


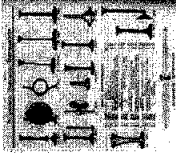
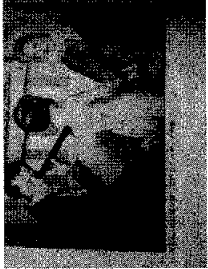
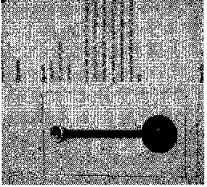

pre-modern 1819~1954	
stage 1. Home / delivery clinic	
birthing place	
Japan	<p>1848</p>  <p>Otto Gottlieb Johann Mohnike brought Laennec's Stethoscope to Japan. Interpreter Baisou Shingawa imitated it and translated the book. The stethoscope is kept at the Nagasaki University</p> <p>1876</p>  <p>Traube's stethoscope was mentioned in a book</p> <p>1927</p>  <p>Mii Takeshima's Midwife bag and tools (Ishikawa History Museum)</p> <p>1934</p>  <p>Osaka Univ. Midwife school circa 1934</p>
USA	<p>1912</p>  <p>Traube's stethoscope introduced on Kny-Scheerer catalog</p>
Europe	<p>1819</p>  <p>Rene Theophile Hyacinthe Laennec: Father of the stethoscope (1781~1826) French physician</p> <p>1850</p>  <p>1850 Stethoscope for obstetric Weiss' catalog 1863</p> <p>1850</p>  <p>Ludwig Traube (1816~1876) German pathologist</p> <p>Traube's stethoscope in a case with percussion hammer and pleximeter by H.Hauptrier/Berlin</p>

Table 5 A historical comparison via photographs of Japan, America and Europe, sorted into three eras, focusing on the diffusion process of the Traube stethoscope and childbirth locations in Japan



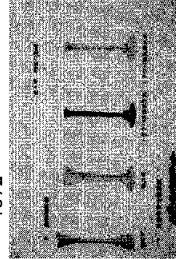




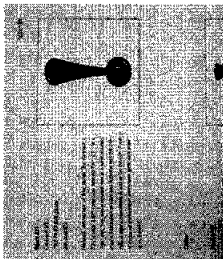


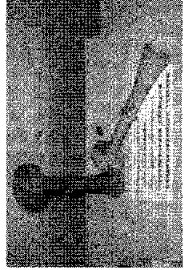


		Post-modern 1997~2006	
birthing place		stage 3 Hospital/Birthing clinic/ Birthing Center in hospital	
Japan	modern 1955~1996	<p>1958 Midwife Journal 12(11) home visiting fetal heart check</p>  <p>1963 Midwife Journal 17(02G) Gravurel fetal heart auscultation</p>  <p>1972 Traube's stethoscope was printed in mother's handbook</p> 	<p>1977 Memorial monument of closing period of Osaka Uni.Midwife School Monument of successor of Osaka Uni. Midwife school</p>  <p>1997 Logo mark of the monument printed on envelope</p>  <p>2006 Practicing with Traube Kagawa Uni. Maternal Nursing</p> 
	USA	<p>1978 Pinard's stethoscope mentioned in Myle's Midwifery Manual</p>  <p>1989 Pinard's stethoscope for obsteric was purchased new</p>  <p>2002 M.Donald Blaufox, Professor of Albert Einstein Uni. New York,USA edited the a history book of the stethoscope. The history of midwifery is on the page of 65-66. Those pictures are on the page of 136-137.</p> 	<p>2002 M.Donald Blaufox, Professor of Albert Einstein Uni. New York,USA edited the a history book of the stethoscope. The history of midwifery is on the page of 65-66. Those pictures are on the page of 136-137.</p> 
Europe	<p>1995 Midwife Sachie Sogoh and Kimiyo Ikezoe attended International Confederation of Midwives (ICM) in Norway, and were given obsteric stethoscope as memory</p> 	<p>Midwife Mieko Takeuchi visited birthing clinic. The stethoscope for obsteric is put beside a bed</p>  	

Table 6 Stage 1: pre-modern Traube (1819-1854) analysis of description literature related to support of mothers by midwives using Traube's stethoscope in Japan

No, Year, author, book's title, vol, page,	descriptions	keyword
No. 2. 1987; Masakiyo Ogata: Regulations to the Midwives at the obstetrical department in Germany, Jhosann no Shiori, 20, 138,	Take the temperature of a mother three times a day and must be noted. Mother, temperature, pulse monitor the fetal heart sound and mother's pulse, must be reported.	mother, temperature, pulse monitor, fetal heart, report
No. 3. 1909; Senko Bunn: Ten Midwives' regulations, Jyosann no Shiori, 158, 3026,	Listen to the fetal heart attentively to avoid missing the sudden change	heart sound, attentively sudden
No. 4. 1919; Hidetoshi Yokoyama: The Heart Beating of Fetus, Jyosann no Shiori, 223, 2056,	Find out the strongest part of the heart sound, define the cardiac position and the fetus. In 1822 the way of listening to the fetal heart heart was found. Both obstetricians and midwives can check the heart sound.	fetus, position, define, found heart sound, 1822, midwives, obstetrician, close watch
No. 5. 1922; Mitsuo Takano: Midwives' Belonging, Jhosann no Shiori, 306, 5475,	There is various stethoscopes, for internist, and for obstetrics like Traube model and Enomoto model. I recommend a obstetric stethoscope for midwives. Familiar one is better for habitual auscultation.	stethoscope for obstetrics, Enomoto model Traube's model
No. 6. 1930; Nobuko Ohtsu: Clinical significance of Cardiac Sound, Jhosann no Shiori, 306, 547,	It is important to auscultate on abdomen. Listening the fetal heart sound is its main intention. Presumption by the heart beat state.	upper abdomen, fetal heart auscultation, state

Table 7 Stage 2: modern Traube (1955-1996) analysis of description literature related to support of mothers by midwives using Traube's stethoscope in Japan

No, Date, Year, date, author, book's title, vol, page	Descriptions	keyword
No. 7. 1956; Shouichi Kinoshita: An Examination of Fetal Heart Sound: Health care and Midwifery, 10(1), 13-16,	We suspect fetus state from out of mother. Diagnostics signification. with Traube's stethoscope. Make full use of a stethoscope.	fetus, state, Traube's stethoscope
No. 8. 1958; Visiting Aoyagi Midwife Clinic: Midwife Journal, 12(8)	There is a woman-to-woman relief, and friendly atmosphere.	friendly, atmosphere
No. 9. 1958; Visiting Midwife Yoshimi Sugawara: Midwife Journal, 12(11)	Have questions, ask condition, blood pressure check, palpation auscultation, help binder, home visiting is a point.	supportive, home visiting
No. 10. 1960; Yachiyo Muraoka: The Report of the First Home Birth, Midwife Journal, 12(11)	Depression of the fetal heart beat in the first stage of labor Diagnosis and auscultation of fetal heart.	fetal heart, auscultation depression
No. 12. 1963; photogravure: Midwife Journal, 17(6), 2	Humanlike love through Traube's stethoscope (at Nihon Univ. med.)	love, humanity
No. 13. 1964; Gin Ohki: A delivery support at Birthing Center, Midwife Journal, 18 (4), 13-15	An attendant is assist till delivery, observe the monitoring, watch the condition of labor pain, spiritual support, give a sense of security.	an attendant, auscultation
No. 17. 1970; Kan Morobashi: Report of Obstetrics and Gynecology, Midwife Journal, (3)	Using a Traube's stethoscope acquire skill. A shortcoming at the labor progresses.	shortcoming, skill
No. 19. 1983; Hisako Iguchi: Link Care from Pregnancy to Child-rearing, Midwife Journal	Dispensary by a midwife: maternal mensuration on examination bed Affirmation of fetus position, medical interview after auscultation	dispensary by a midwife
No. 21. 1994; Delivery- woman and man: Michiko Ohbayashi, Keiso-shoboh, 82	A midwife in private practice who has 50 years career said; I can listen to heart beat, fetal souffle, and the fetal heart sound has indescribable tone, better and nicer than the sound by Doppler	indescribable tone

Table 8 Stage 3: post-modern Traube (1997-2006) analysis of description literature on support of mothers by midwives in post-modern Japan

No, Year, issue, auther, title, vol, number, page	Abstract of descriptions	keyword
No. 23. 1997; WHO Care in normal birth: a practice guide Agriculture and Fishery Culture Association	The case of Traube's stethoscope, production cost is low, and technology easily make and use though its technology is appropriate. A parturient woman can move freely. A properly trained person can monitor the fetal heart out of hospital environment.	Appropriate technology fetal sound, observation without EMF outside of hospital
No. 18. 2000; Etsuko Matsuoka: Midwife Journal, 54(12), 2224	High technology equipment (EFM) is very useful for providing unforeseen birth. Intensify parturition is under control. Electronic monitor took the place of Traube's stethoscope. EFM made medical procedure possible.	Doppler's merit and demerit merit of parturition control, EMF, Continuous observation medical procedure
No. 24. 1999; Tomoko Ohno: Good-by delivery bed, 153-154	Intermittent auscultation with Doppler or the stethoscope is useful. AASPOG mentioned the effectuality of auscultation intermittently or continuously, no difference.	Intermittent auscultation Doppler, effectuality
No. 27. 2002; The search for appropriate birth technology: Marsden Wagner, 179, Medica Publisher	No evidence of giving good influence on the last stage of delivery with EFM. EFM must apply the case of medical case chosen carefully and the inducted birth. In 1988, AAP and ASPOG issued a joint statement. Intermittent auscultation at 15-minutes intervals showed its value as same as the monitoring with EFM. Observe low risk delivery by auscultation is acknowledgeable.	low-risk delivery acknowledgment of auscultation monitoring
No. 19. 2002; Akemi Murakami: Midwife Journal, 5(4), 10	I watched a woman's look and attitude, touched her abdomen, and checked	observe pregnant woman palpation
No. 20. 2002; Kazuko Sako: Midwife Journal, 56(1), 59	Feel with hands, when I concentrate to listen to her talk, I noticed her	midwives' intuitive
No. 30. 2004; Takashi Okai: Thinking on fetal heart rate monitoring, JSPOG Journal, N48, 56(9),	Study on low risk pregnancy. Intermittent heart rate monitoring proved (with the stethoscope or Doppler) the perinatal mortality is not different	stethoscopes' usefulness at low risk birth
No. 21. 2006; Reiko Inoue: Midwife, 60(2), 10-12 No. 22, Yoko Takahashi: Midwife, 60(2), 14-18	The modern obsteric equipments don't work in an emergency The necessities in an emergency aid	Maternal Support in an emergency Necessities
No. 23. 2006; Yuko Kawano: The physical examinations for midwives, Midwife Journal, 60(3), 264	Testing the same auscultation as a stethoscope with Doppler Estimate the presence of the variability by uninterrupted monitoring	significance of stethoscopes Variability, prediction
No. 24. 2006; Michiko Sugiyama: Midwife Journal, The monitoring with Doppler	Estimate the presence of the variability by uninterrupted monitoring Knowledge of the birth physiology and the fetal heart auscultation on the birth progress	knowledge of gynecology and physiology
No. 25. 2006; Masakatsu Sase: The physical examinations for midwives Midwife Journal, 60(1), 86	The development of the portable ultrasound unit	evolution of the high technology equipments

that focused on the childbirth location in Japan, the history of the Traubestethoscope in the three regions of Japan, America and Europe, and the support of mothers as seen in photographs, it was possible to do a historical comparison of the three regions from the invention of the Traubestetho-

scope and through its processes of importation, development, improvement, and popularization. After the invention of the stethoscope by European physicians in the 1800s, the stethoscope was imported to America and Japan, and there is a history of development, improvement and popu-

larization of the stethoscope in those countries. It was a ground-breaking diagnostic tool for doctors in those days, and we consider this the dawn of the stethoscope, when original stethoscopes were being developed. In obstetrics, a paper was written in 1821 on listening to the fetal heartbeat, and the history of the obstetric stethoscope began. We believe this is supported by the description No. 4 (Table 6) which states "with the discovery of a method for listening to the heartbeat of an unborn child, in 1822 it is possible for both doctor and midwife to listen to the unborn child's heartbeat and safeguard its life".

3. We created a summary of descriptions related to support of mothers by midwives in Japan using the Traubestethoscope, and an analysis of descriptive literature created with keywords, and when we analyzed the historic process with descriptions divided into the three stages of Traube-history, we believe that stage 1 is the era when the significance and necessity for midwives to listen to the fetal heartbeat with a Traubestethoscope began to be learned, with a 1904 document called the 'Midwife Guidebook' which included contributions by Noriko HARA, the only midwife. In stage 1 there are descriptions of Japanese midwives having used the Traubestethoscope from 1897-1983 (table 6 No. 2, table 7 No. 19). However in stage 1, there are no surviving descriptions regarding how the Traubestethoscope was used by midwives to support mothers, so this is unclear, however in stage 2, we were able to study how "spiritual bonds" were established between the "mothers" and the "midwives who believe in a genial birth" using the Traubestethoscope as an intermediate; these midwives would carry out palpitations, examinations, and listening, while mastering the diagnostic arts with their own senses, using themselves as a measurement tool and the Traubestethoscope as a medium to connect the midwife and the mother. 1955 was a turning point, where the introduction of ME equipment began, with hospital childbirth under doctors, and this also included high-tech diagnostic techniques, however it could also be said that at the same time, midwife diagnostic techniques using the Traubestethoscope were neglected.

4. From the expression for midwives of listening to the unborn child's heartbeat using a Traubestethoscope as "an indescribable timbre" (table 7 No. 21), we believe that when childbirth began, the midwife listened to the fetal heartbeat and strove

for early detection of a decline in the fetal heartbeat at each opportunity throughout the whole period, and furthermore ensured emotional stability by getting close to the mother using the Traubestethoscope. By using the Traubestethoscope to get close to the mother and child, the midwives encouraged the mothers, and utilized their hands-on midwifery using their five senses, with their own hands, ears, eyes and heart, and we believe that their spirits, knowledge and skills were cultivated as they practiced midwifery, while listening to the fetal heartbeat using the Traubestethoscope. Furthermore, from the descriptions of midwives using the Traubestethoscope from 1958-1983 (table 7 No. 8, 9, table 8 No. 19), we believe that the midwives carried out a midwife examination that protected the lives of the mother and child, and deepened the bond with the mothers, by listening to the fetal heartbeat and palpating the abdomen of the mothers, using the Traubestethoscope as an intermediate. Also, from midwives supports mothers using the Traubestethoscope (table 4) in the history through photographs of the period from 1927-1972 and (table 7), we believe that the midwives deepened the love, bonds and prayers for each mother and child by supporting the mothers with their warm hands and hearts, and the mothers developed trust and a sense of security towards the midwives, and deepened their spiritual bonds.

5. In America, a description from 1989 can be seen (table 3) which states "the Pinard obstetric stethoscope was newly launched in Manhattan", and the Traubestethoscope was sold again, and this can be interpreted as the flow of an era of midwives who respect a natural birth that is kind to a woman's body. This also builds upon the historical background that is a part of the 1970s women's liberation movement, wherein awareness was generated regarding natural childbirth which values a woman's body and soul, and we believe this context is the same as the global spread of attitudes for women giving birth via the Lamaze technique or active birth. Furthermore, from analysis of the photographs, in Amsterdam in Europe, even now three Traubestethoscopes are placed on the examination table (table 5), and in normal deliveries, childbirth occurs using Traubestethoscopes. Evolving high-tech (table 8 No. 25) is a feature of post-modern Traube in Japan, however amidst the changing process of methods for listening to fetal heartbeat in the advances in medical science, we believe that when it comes to listening to the fetal heartbeat,

they are listening with the same feeling as when they listened to the fetal heartbeat with the midwife's Traubestethoscope in stage 1, using the Traubestethoscope which is a symbol of midwives, in a "monument inheriting 121 years of history of the Osaka University Midwife School", where midwife training began in Japan in 1876. According to a WHO proposal in 1997 (table 8 No. 23, 28) post-modern Traubeis certainly spreading around the world and the activities of midwives are being reassessed. Childbirth locations are decided according to the mother's own choice and responsibility, and midwives are giving thought to supporting mothers in ways suited to their individual lifestyles, respecting the self-determination of the mothers, and we believe that the process of midwives forming bonds with mothers by staying close to the mothers and listening to the fetal heartbeat is the post-modern Traube.

V. Conclusion

1. In the analysis for this research, the eras of historical processes where midwives used the Traubestethoscope to support mothers were divided into three categories (stage 1: pre-modern Traube, stage 2: modern Traube, and stage 3: post-modern Traube), and the "spiritual bonds" were able to be extracted from the literature, which is the historical footprints of midwifery.

2. The history of the origins of the Traubestethoscope used in midwife examinations started in Europe, and after the listening of fetal heartbeats in obstetrics in 1821, this history continued in America and Japan, with improvements and popularization processes of the obstetric stethoscope in each country. The history of the Traubestethoscope, inherited by midwives, has become clear, and although its historical process, the significance of the Traubestethoscope used today, and the usage of the Traubestethoscope at the time of childbirth differs depending on the historical, cultural and social backdrops of Japan, America and Europe, it can nonetheless be assessed as a medical instrument that builds "spiritual bonds" with mothers.

3. Midwives who have been supporting mothers using the Traubestethoscope as an intermediate since pre-modern Traube have inherited the spirit, knowledge and skills of midwifery, and have a history as a "normal birth specialist" who deepens spiritual bonds with mothers using the Traubestethoscope, which is the emotional mainstay of the midwife. The history of midwifery, which has been cultivated since pre-modern

Traube, continues in the current post-modern Traube, with childbirth in homes and areas. The concepts of hands-on midwifery that encourages mothers and uses all five senses have been cultivated since pre-modern Traube through midwife examinations and implementation while listening to the fetal heartbeat using the Traubestethoscope; this has been reconsidered and is reflected in today's post-modern Traube.

Limits of this Study and Future Outlooks

For this study, we focused on the history of the Traubestethoscope as used by midwives, and collected details recorded in documents which were considered primary historical sources. We then reviewed the data, and divided the state of midwifery in Japan into three categories based on the era and the details. From there, we investigated the relationships and bonds between midwives and mothers. However, details records and quantity of records for this study were limited and could not be considered sufficient. For future outlooks, it is important to continue this research by interpreting facts related to the duties and practices of midwives, as well as the social context of the eras, so that archive searching of literature studies and detailed analysis via data can be carried out developmentally. In particular it is thought that this would be invaluable with the recent trend of low birth rates in Japan's society as there is not much historical research related to the midwives who actively support the mother, child and family at the childbirth location.

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