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Electrosurgery: A Global Perspective.

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ABSTRACT

Electrosurgery makes use of high-frequency electrical current to cut, coagulate, desiccate, and fulgurate tissue and can be performed using either monopolar or bipolar-energy in conjunction with a specialized instrument. Based on the type of product, the global electrosurgery market is classified into three major segments, namely, electrosurgical generators, electrosurgical instruments and accessories, and argon and smoke management systems. The global electrosurgery market was dominated by Covidien plc (Ireland), Ethicon (U.S.), and Olympus Corporation (Japan) in 2013. As of 2014, North America holds the largest share of the global electrosurgery market, followed by Europe. However, the Asia-Pacific market is expected to grow at highest CAGR of ~8% from 2014 to 2019. The global electrosurgical devices market will experience steady growth, rising from $4.35 billion in 2015 to $5.56 billion by 2021, representing a Compound Annual Growth Rate (CAGR) of 4.11%, says research and consulting firm GlobalData. This expansion, which will occur across the 10 major markets (10MM) of the US, France, Germany, Italy, Spain, UK, China, India, Brazil and Japan, will be driven by an increase in minimally invasive procedures, the growth of computer-assisted surgery, aging populations, and untapped potential in emerging markets.

Keywords: Electrosurgery, electrocautery, electrosurgical devices market, global electrosurgery market

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INTRODUCTION

Electrosurgery makes use of high-frequency electrical current to cut, coagulate, desiccate, and fulgurate tissue and can be performed using either monopolar or bipolar-energy in conjunction with a specialized instrument. Monopolar electrosurgery can be used for several modalities including cut, blend, desiccation, and fulguration. Using a pencil instrument, the active electrode is placed in the entry site and can be used to cut tissue and coagulate bleeding. The return electrode pad is attached to the patient, so the electrical current flows from the generator to the electrode through the target tissue, to the patient return pad and back to the generator. Monopolar electrosurgery is the most commonly used because of its versatility and effectiveness. Bipolar electrosurgery uses lower voltages so less energy is required [1].

Based on the type of product, the global electrosurgery market is classified into three major segments, namely, electrosurgical generators, electrosurgical instruments and accessories, and argon and smoke management systems. The electrosurgical instruments and accessories segment is further classified into electrosurgical instruments and electrosurgical accessories. The electrosurgical instruments market is categorized as bipolar instruments (advanced vessel sealing instruments and bipolar forceps) and monopolar instruments (electrosurgical pencils, electrosurgical electrodes, suction coagulators, and monopolar forceps). Likewise, the electrosurgical accessories market is also categorized into three major segments, namely, patient return electrodes; cords, cables, and adapters; and others (foot switches, carts, and tip cleaners).

Furthermore, the global electrosurgery market is divided into eight segments on the basis of type of surgery, namely, general surgery, gynecology surgery, urologic surgery, orthopedic surgery, cardiovascular surgery, cosmetic surgery, neurosurgery, and others (ENT, dermatology, and ophthalmic surgeries) [2].

The terms electrosurgery and electrocautery are frequently confused, even amongst many professionals working in various healthcare related fields. Even though both of these procedures are applied within several medical specialties, they are quite different in terms of both tools used and method of application. Electrosurgery passes electrical current through tissue to accomplish a desired result. The electricity used is a form of alternating current similar to that used to generate radio waves. The typical frequency is quite high, with the norm being around 500,000 cycles per second. This ensures that the current passes through the patients tissue as opposed to producing an electric shock effect. The heat is created by the resistance of the tissue to the electrical current and the tools used to apply the current are electrodes and includes blades, round ball, needle and loop configurations . The electrode selection depends upon and intended outcome.

Electrocautery uses electrical current to heat a metal wire that is then applied to the target tissue in order to burn or coagulate the specific area of tissue. It is not used to pass the current through tissue, but rather is applied directly onto the targeted area of treatment. Using this technique, heat is passed through a resistant metal wire which is used as an electrode. This hot electrode is then placed directly onto the treatment area destroying that specific tissue. This use of electricity is typically applied in superficial situations encountered by dermatologists, ophthalmologists, plastic surgeons, urologists, and related specialties. Another rather obvious difference between the two is that electrocautery devices are usually small, battery operated, devices which use physical heat to destroy the targeted tissues or cause a specific and desired effect. The electosurgery devices are more sophisticated radio-wave generators that pass modified electrical current through the target tissues to achieve the desired surgical result [3].

Electrosurgical Devices Market- Global perspective

The below illustration depicts the top-down and bottom-up approaches of global giants in the electrosurgery market (Figure No:1) [4].

It has been estimated that electrosurgery market was dominated by Covidien plc (Ireland), Ethicon (U.S.), and Olympus Corporation (Japan) in 2013. These three companies together accounted for a share of 78% of the global electrosurgery market in 2013. The global electrosurgery market was dominated by Covidien plc (Ireland), Ethicon (U.S.), and Olympus Corporation (Japan) in 2013. These three companies together accounted for a share of 78% of the global electrosurgery market in 2013.

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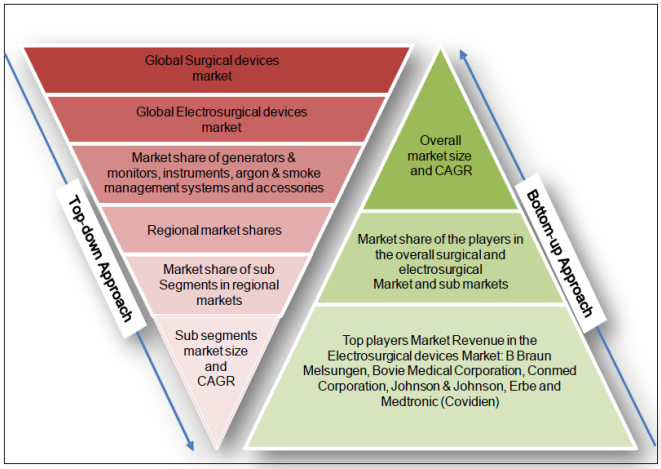
Figure No 1

ELECTROSURGICAL DEVICES MARKET: TOP-DOWN AND BOTTOM-UP APPROACH



Covidien plc was the leader in this market with a share of 37% in 2013 and is expected to lead the market in the next five years as well. The company's wide range of product offerings coupled with its wide geographic presence enables it to maintain its leading position in the global electrosurgery market. Furthermore, the company focuses on development of innovative products and strategic acquisitions as its key business strategy to ensure its growth in the global electrosurgery market.

Ethicon (U.S.) held the second position in the electrosurgery market in 2013. Over the past three years, the company has been focusing on innovative product development, new product launches, and acquisitions as its key business strategies, in order to increase its share in the global electrosurgery market. In addition to the top market players, companies such as B. Braun Melsungen AG (Germany), Bovie Medical Corporation (U.S.), Olympus Corporation (Japan), and ERBE Elektromedizin GmbH (Germany) are primarily focused towards launching the new electrosurgical devices and acquisitions to widen their product offerings.

Major strategic developments are taking place in the field of advanced vessel sealing instruments market, which exhibits high-growth potential in the near future. Dominant market players such as Covidien plc (Ireland), Ethicon (U.S.), Bovie Medical Corporation (U.S.), and Olympus Corporation (Japan) introduced several technologically advanced vessel sealing instruments in order to keep pace with the industry trends [5].

As of 2014, North America holds the largest share of the global electrosurgery market, followed by Europe. However, the Asia-Pacific market is expected to grow at highest CAGR of ~8% from 2014 to 2019. A number of factors including rising government efforts to increase the population access to the elective surgery, improving healthcare infrastructure, and growing popularity of cosmetic surgery are stimulating the growth of the electrosurgery market in the Asia-Pacific region.

B. Braun Melsungen AG (Germany), Bovie Medical Corporation (U.S.), BOWA-electronic GmbH Co. KG (Germany), CONMED Corporation (U.S.), Covidien plc (Ireland), Ethicon (U.S.), ERBE Elektromedizin GmbH (Germany), KLS Martin Group (Germany), Olympus Corporation (Japan), and Utah Medical Products, Inc. (U.S.) are the major players in the electrosurgery market [6].

The global electrosurgical devices market is expected to reach $1,412.8m by 2018 growing at a CAGR of 5%. The global electrosurgical devices market is dominated by three companies - Covidien, Erbe and ConMed. Covidien is the market leader with nearly 40% market share. Erbe is the second largest market player with an 11% market share. Erbe has a strong presence in European countries such as Germany. The company also has a significant presence in the US electrosurgical devices market. ConMed is the third largest market player with an 8% market share. ConMed displays strong presence in both the US and Asia-Pacific markets. Other significant market players include Bovie, KLS Martin, B. Braun and Bowa. However, all of these companies have less than 5% market shares in the global market [7].

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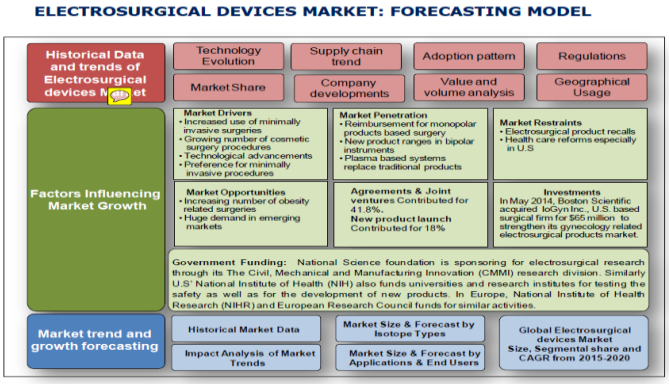
Geographically, global surgical equipment market is segmented into North America, Europe, Asia-Pacific and LAMEA. Potential regions of the respective geographies are strategically analyzed to provide country wise intelligence of the surgical equipment. North America dominates the global surgical equipment market followed by Europe and Asia-Pacific. The growth in North America and Europe is primarily driven by advent of new technologies, growing ageing population, favorable regulatory framework and high disposable income among the consumers. However, business dynamics in Asia-pacific is expected to witness substantial growth owing to advancing medical tourism industry, rising unmet healthcare needs, rising prevalence of chronic diseases that require surgical procedures and favorable reimbursement scenarios [8].

Figure No 2

Minimal invasive surgery offer huge benefits for patients as well as surgeons such as fast recovery, fewer post surgery infections, condensed visible marks, bleeding control and improved accuracy are some of the major drivers of electro surgical market. Increasing risk of side effects from these electrosurgery devices is one of the major challenges hindering the market growth. Other factors consists of rising trends in purchasing in bulk through group health organizations and through integrated health networks which creates increasing price pressure on the market players.

The budding markets including India, China, Brazil and Mexico became attractive for companies involved in this market. Increasing trends in medical tourism, government initiatives for development of modern health care systems, reimbursements and huge population base are some of the factors that attract the electrosurgical device market in emerging countries.(Figure No:2) [9].

Figure No 3



The above model clearly illustrates the factors that influence market growth with regard to electrosurgical devices starting from market drivers, market penetration, market restraints, market opportunities agreements and investments and the forecast of how the market trend is likely to be by 2020 (Figure No:3)[10]. A number of factors such as development of advanced energy based electrosurgical devices, rising demand of minimally invasive surgical procedures, and worldwide rise in the aging population are driving the growth of the global electrosurgery market. On the other hand, factors such as product recalls, increasing

government pressure to reduce the healthcare cost and rising trend of bulk purchasing through GPOs (Group Purchasing Organizations) and INHs (Integrated Health Networks) are restricting the growth of the global electrosurgery market.

CONCLUSION

The emerging markets including China, India, Brazil, and Mexico have became attractive for the companies engaged in the development and marketing of the electrosurgery devices. Rising trends of medical tourism in these countries owing to low cost surgeries, huge population base, and government initiatives to develop a modern healthcare system with corresponding reimbursement structures are the key factors propelling the demand of the electrosurgery devices in the emerging markets. The global electrosurgical devices market will experience steady growth, rising from $4.35 billion in 2015 to $5.56 billion by 2021, representing a Compound Annual Growth Rate (CAGR) of 4.11%, says research and consulting firm GlobalData. This expansion, which will occur across the 10 major markets (10MM) of the US, France, Germany, Italy, Spain, UK, China, India, Brazil and Japan, will be driven by an increase in minimally invasive procedures, the growth of computer-assisted surgery, aging populations, and untapped potential in emerging markets [11].

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