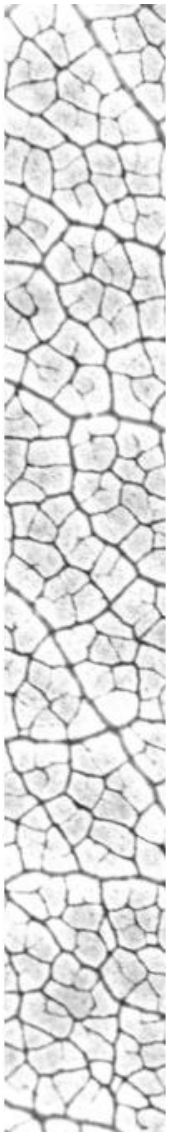

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Old premise on maternal death at tertiary referral hospital in Surabaya, Indonesia: too old, too little, too late

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Abstract
Maternal death is the death of woman during pregnancy, labor, and 42 days postpartum. This study aimed to analyze maternal death at Dr. Soetomo General Hospital, Surabaya in 2019. This was a retrospective study from medical records, weekly reports, audit maternal perinatal death, and morning reports. The data were classified according to maternal, obstetrics, cause of death, and referral characteristics. There were 81 maternal deaths. There were 39% of subjects over 35 years old. Mostly, the subjects were multiparous (76%). Forty-three percent had less than 2 days length of stay, all of them were non-booked case patients, 60% were with direct cause, 80% were hypertensive disease-related, 13% were bleeding, and 8% had indirect cause of heart disease in pregnancy, mostly preventable. Less than two days death were significantly higher in proportion of preeclampsia, postpartum hemorrhagic (PPH) and heart disease in pregnancy (HDiP), reduced GCS, dyspnea, and acidosis not for distant factor (Surabaya vs Non-Surabaya) and preventability. Higher proportions of mothers were aged over 35 years old, multiparous, having direct cause and mostly less than 2 days of length of stay.

Keywords: maternal death, tertiary referral hospital, LOS less than 2 days, proposed aggressive management

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INTRODUCTION

WHO defines maternal death as the death of a woman during pregnancy, labor, and 42 days postpartum (World Health Organization 2015). It is recognized that different profiles occur between maternal mortality in tertiary hospitals and other health facilities and also between other studies. Analysis of maternal death in tertiary hospitals allows us to have the opportunity to have a bigger picture (because all districts send to this hospital), analysis from different perspectives, and to propose response based on the findings.

According to WHO, every day in 2017, approximately 810 women died from preventable causes related to pregnancy and childbirth. Between 2000 and 2017, the maternal mortality ratio dropped by about 38% worldwide. Ninety-four percent of all maternal deaths occurred in low and lower middle-income countries (World Bank 2019). Indonesia has 260 million population with economy growing >5-6% yearly since 2000, 8th largest economy in the world in 2015, literacy rate of 92%, contraceptive prevalence of 60%, high antenatal care, skilled attendance at birth, facility-based birth, and more than 200,000 midwives (HyreA 2016).

East Java has 38-40 million people, hundreds of hospitals, hundreds of obgyn specialist, maternal-fetal-medicine (MFM) subspecialists, and thousand midwives. Dr. Soetomo General Hospital in Surabaya has 1500 beds, 100 beds for obgyn patients, 40 obgyn specialists, 12 MFM subspecialists, 1400 deliveries a year, 45% caesarean delivery, and the biggest cases of placenta accrete syndrome disorders obviously has unique positions. Maternal deaths at Dr. Soetomo General Hospital reflect what happened to maternity care at East Java as a whole. Delivery assistance is needed by adequate health workers in a adequate health facility because if complications occur, such as preeclampsia, it can be treated immediately (Handriani et al. 2015). We focused to analyze maternal death at Dr. Soetomo General Hospital, Surabaya, Indonesia in 2019.

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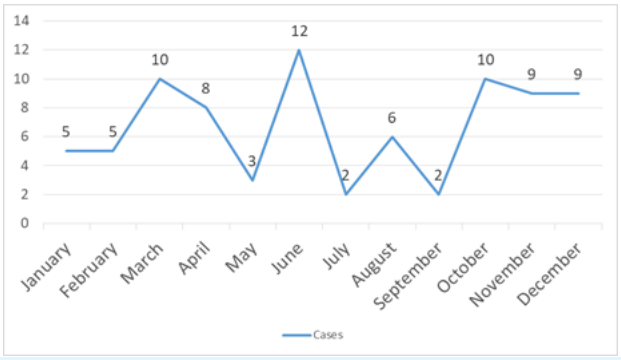


Fig. 1. Distribution of maternal deaths according to months

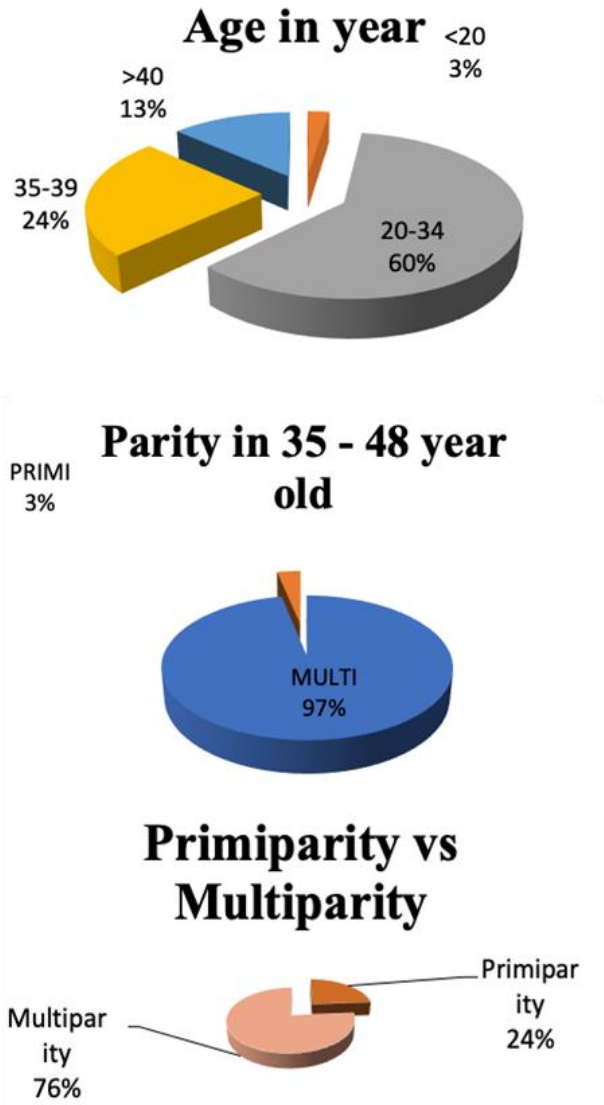


Fig. 2. Distribution of maternal deaths according to age and parity

METHODS

A retrospective analysis based on maternal death reports, maternal death audit, and weekly reports. We had no medical autopsies for the time being, thus the causes of death were being made on clinical and laboratory bases. Analysis was performed with focus on age, parity, referral system, length of stay, cause of death, and clinical and laboratory findings at admission. Age was stated in year, parity was in number, length of stay was in days and classified in ≤2 days, 3 – 10 and ≥11 days. The conditions at admission were blood pressure, pulse, respiratory rate, temperature, and laboratorium examinations. Preventability was decided by discussion based on Berg's criteria (Berg et al. 2005).

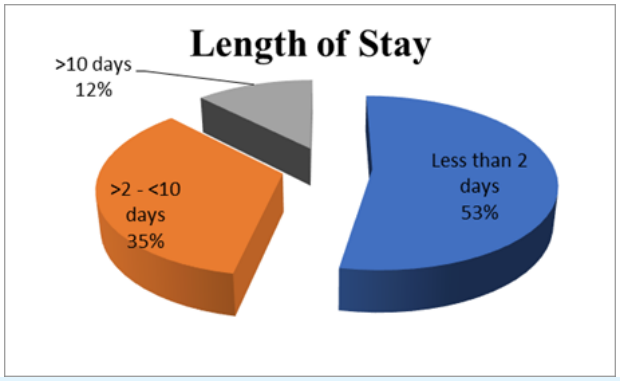


Fig. 3. Proportion of length of stay (LOS)

RESULTS

Distribution According to Month

There were 81 maternal death in 2019. The most maternal death was in June according to month as many as 12 cases (**Fig. 1**). Not all of the data were complete, there were at least 5 deaths that could not be traced because location of death not in Obgyn departement and 2 others no medical records available.

Distribution According to Age and Parity

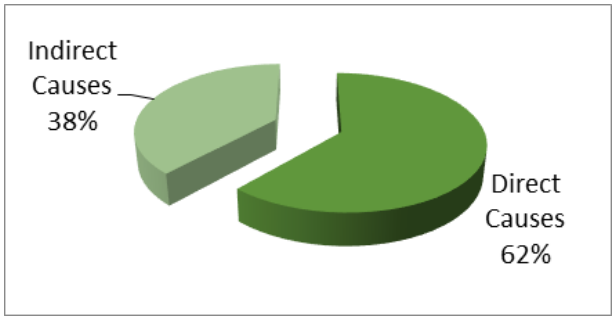
Most subjects were 20-34 years old (60%), 37% were over 35 years, and 13% were over 40 years. Most subjects were multiparous (76%), especially in more than 40 years, the multiparous was 97%. It can be concluded that the pregnancy is unintended from contraceptive device failure or other factors. The youngest was 19 years old, and the oldest was 48 years old (**Fig. 2**).

Proportion of Length of Stay (LOS)

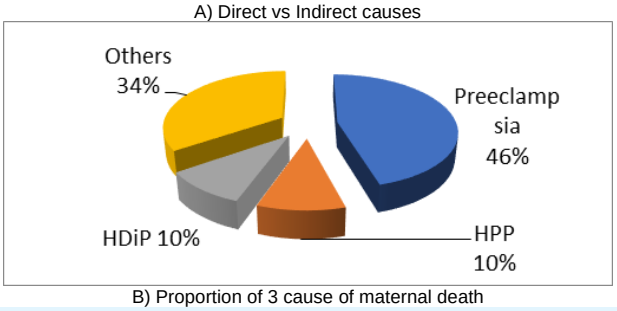
Surprisingly, proportion of the less than 2 days maternal death were 53%, indicating that the problem was prehospital treatment (**Fig. 3**).

Proportion of Direct versus Indirect Causes and Cause of Maternal Death

Proportions of maternal death in less than 2 days caused by preeclampsia and preeclampsia, postpartum hemorrhagic (PPH), and heart disease in pregnancy (HDiP) were significantly higher ($p < 0.05$). Proportions of maternal deaths less than 2 days related to reduced



A) Direct vs Indirect causes



B) Proportion of 3 cause of maternal death

Fig. 4. Three causes of maternal death occur in more 66% of the causes

GCS, dyspnea, and acidosis at the time of admission were significantly higher ($p < 0.05$) (**Fig. 4**).

DISCUSSION

Compared to other studies on Indonesia, there were differences in focus between these studies. This study focused on the trend and what we could be done to avoid those factors, especially to answer the proportion of age over 35 year old as representative of family planning and eligibility to get pregnant, less than 48 hours death as representative of delayed in refer or prehospital diagnosis and treatment, proportion of direct cause to indirect, proportion of 3 largest causes of maternal death, and proportion of good/bad condition according to clinical and laboratory exam at admission.

Previous study analyzed maternal death at 5 regencies in East Java, Indonesia and found significantly differences in high-risk pregnancy detection by healthcare personnel and obstetrics complications management. There were no significant differences in frequencies of antenatal care, birth attendant, puerperal health care, detection of high-risk pregnancy by community, and family planning program (Prasetyo et al. 2018). In addition, 75 of 90 (83 percent) maternal deaths investigated were directly induced by obstetric causes in a recent study. The leading direct cause of death was severe preeclampsia and eclampsia combined being a major cause of maternal morbidity and mortality (Baharuddin et al. 2019, Lumbanraja 2013). If there are delays in medical treatment, including delay in identified pregnancy risk and dangerous sign and delay in accessibility to health facilities and taking good health services, maternal mortality may occur (Syarifuddin et al. 2019).

Human resource/health factors have been reported more often than availability, service, and facilities factors. As much as 90% of maternal deaths were considered preventable. Obgyn was either delayed in seeing patient or not available in approximately 70% of cases, clinical management and decision making was inappropriate in approximately 50% of cases, women experienced delay along referral pathway in approximately 30% of cases, 72% of the cases should have survived, and another 24% would have most likely survived with proper care (HyreA 2016). Another report stated the root causes were found in poor quality of care causing hospital to be unprepared to manage deteriorating patients. The inadequate implementation of standard operating procedures in hospitals has been induced by deficient expertise, lack of strategic preparation, weak coordination, and a shortage of basic resources (Mahmood et al. 2018). However, in Indonesia, The Expanding Maternal and Neonatal Survival (EMAS) approach emphasizes readiness for facilities and compliance with performance standards significantly improving labor monitoring and prevention of complications during childbirth. (Tholandi et al. 2019). A large-scale mentoring improves engagement and efficiency of health facility and health office staff and broke down gaps of public and private facilities in EMAS involvement (HyreAnne et al. 2019). The EMAS program also helps improving the management of obstetrics and newborn risks, including coordination, transport and preparedness for pregnant mothers in need of referrals, hospital emergency readiness and staff preparedness (Pedrana et al. 2019).

Despite significant improvements in key economic and health indicators and MMRs between 1990 and 2015, maternal deaths are still high in Indonesia. (Ahmed et al. 2019). Recent research has shown that near misses received relatively better quality care than maternal deaths. Faster response time and better care are provided to the near misses. Timely referral systems have helped preventing maternal death (Mawarti et al. 2017). The risk factors contributing to maternal deaths include pregnancy complication, delivery complication, puerperal complication, maternal age, prior medical history, antenatal care, and area of residence (Astuti et al. 2017, Fitriani et al. 2019). Maternal complications are also increased by caesarean delivery and anemia during pregnancy (Chongsuvivatwong et al. 2010, Lumbanraja et al. 2019). These complications increase in high-risk pregnant women, such as morbid obesity (Aprilia et al. 2018). This is similar to other studies reporting that most deaths were direct, with 28% attributed to hemorrhaged, 79% may be considered preventable, with laboratory delays present in 54%, and medication shortages present in 29% of cases (De Silva et al. 2020). In addition, further reductions in maternal mortality in Indonesia may require change of focus to increase the supply of doctors and access to hospitals (Cameron et

al. 2019, Maju Perempuan Indonesia Untuk Penanggulangan Kemiskinan 2015).

We recognized that there are many propositions by some experts in reducing maternal mortality. An earlier report in Malaysia stated that ensuring professionalization of midwifery services, expanding access to childbirth by trained personnel, ensuring a reliable and fast referral system, providing medicines, equipment and support needed by mothers, ensuring the availability of emergency midwifery care throughout the country and focusing the effort to maintain the quality of service are important factors. (Ravichandran et al. 2014). Another study proposes that with the opportunity presented by a systematic shared data system accurately recorded for all maternal deaths and the state and local maternal mortality review committee may become the gold standard for comprising the true burden of maternal mortality at the national level (Pierre et al. 2018). New and better code and classification of maternal deaths are proposed by another report (Hoyert et al. 2020). Meanwhile, recent study suggested that every hospital should have an ongoing safety and quality improvement program distinct from the usual peer review process, especially at tertiary-care facilities as follows: protocols, guidelines and bundles, simulation, checklist, and also AOI (Adverse Obstetric Index). Obstetrics Guidelines for Intensive Care Unit are Admission and Triage classifying patients into five priorities (Resnik et al. 2018). Some authors suggested the use of MEOWS and admission to ICU in critically ill obstetrics patients (Friedman et al. 2018, Joseph et al. 2018, Robbins et al. 2019, Umar et al. 2019).

CONCLUSION

Higher proportions of mothers were aged over 35 years old, multiparous, having direct cause and mostly less than 2 days of length of stay.

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